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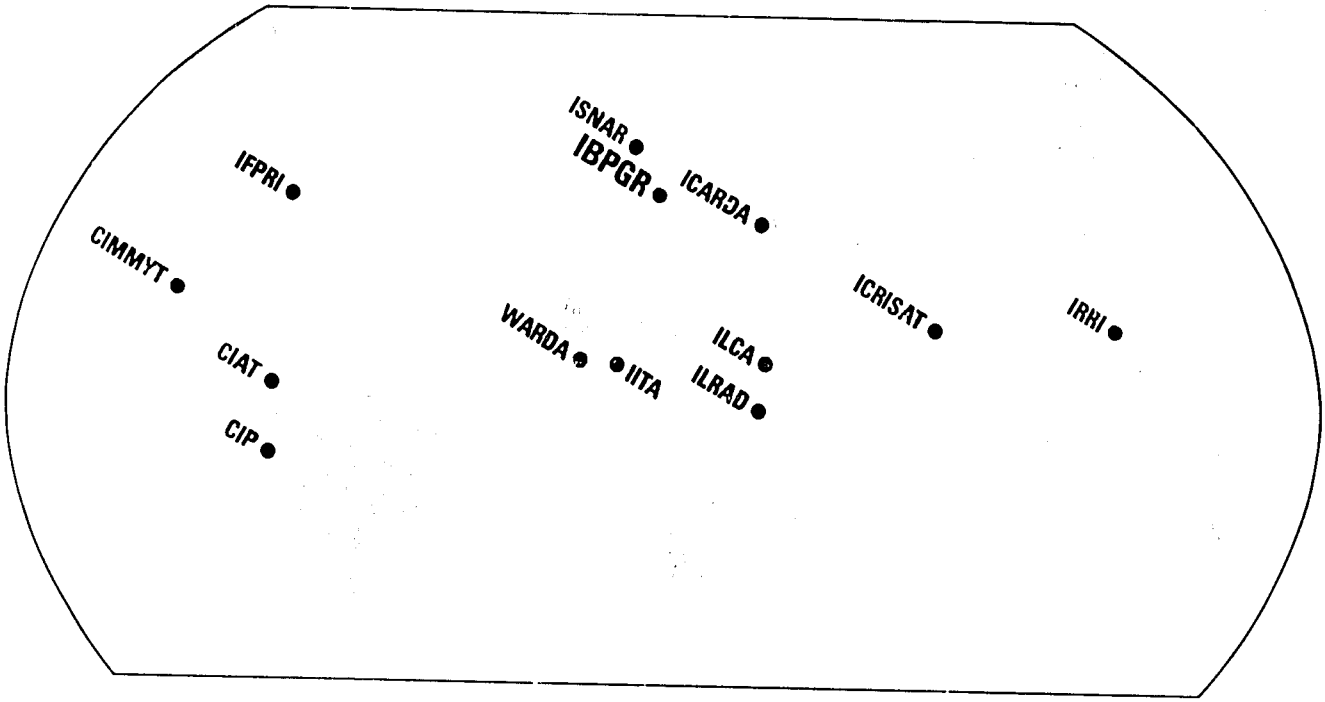
Annual Report 1989

IBPGR

INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

International Agricultural Research Centres of the CGIAR



Abbreviations used in this report

AAASA	Association for the Advancement of Agricultural Sciences in Africa, Addis Ababa, Ethiopia
ACSAD	Arab Centre for the Study of Arid Zones and Dry Lands, Syria
ARARI	Aegean Regional Agricultural Research Institute, Menemen, Turkey
ARC	Agricultural Research Centre, Giza, Egypt
ARI	Agricultural Research Institute, Cyprus
ARS	Agriculture Research Service, USA
AVRDC	Asian Vegetable Research and Development Center, Taiwan, China
BARI	Bangladesh Agricultural Research Institute, Bangladesh
BBTV	Banana bunchy top virus
BVRC	Beijing Vegetable Research Centre, Beijing, China
BJRI	Bangladesh Jute Research Institute
CAAS	Chinese Academy of Agricultural Sciences, Beijing, China
CAC-USDA	Crop Advisory Committee, United States Department of Agriculture
CARARI	Central Anatolian Regional Agricultural Research Institute, Ulus-Ankara, Turkey
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza, Turrialba, Costa Rica
CEC	Commission of Economic Communities
CENARGEN	Centro Nacional de Recursos Geneticos, Brasilia, Brazil
CGIAR	Consultative Group on International Agricultural Research
CGN	Centre for Genetic Resources, Wageningen, The Netherlands
CIAT	Centro Internacional de Agricultura Tropical – CGIAR, Colombia
CICA	Centro de Investigación en Cultivos Andinos, Peru
CIMMYT	Centro Internacional de Mejoramiento de Maiz y Trigo – CGIAR, Mexico
CIP	Centro Internacional de la Papa – CGIAR, Peru
CNR	Consiglio Nazionale delle Ricerche, Italy
CRI	Crops Research Institute, Hungary
CSIRO	Commonwealth Scientific and Industrial Research Organization, Australia
DGIS	Directorate General for International Cooperation, The Netherlands
DGRST	Delegation Generale à la Recherche Scietifique, Dakar, Senegal
EAN	Estaçao Agronomica Nacional, Portugal
EC	European Community
ECP/GR	European Cooperative Programme for Conservation and Exchange of Crop Genetic Resources
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuaria, Brazil
ETSIA	Escuela Técnica Superior de Ingenieros Agrónomos, Spain
FAL	Institut für Pflanzenbau und Pflanzenzüchtung der Bundesforschungsanstalt für Landwirtschaft, Braunschweig, FRG
FAO	Food and Agriculture Organization of the United Nations
FOFIFA	National Centre for Applied Research and Rural Development, Madagascar
FONIAP	Fondo Nacional de Investigaciones Agropecuarias, Venezuela
GRAAS	Genetic Resources Accession Assessment Score

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International Board for
Plant Genetic Resources

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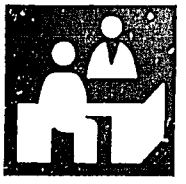

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Ir D.H. van Sloten*,
Acting Director, IBPGR

Professor J.T. Williams,
Director, IBPGR

* from April to November 1989

The International Board for Plant Genetic Resources is an autonomous international scientific organization under the aegis of the Consultative Group on International Agricultural Research. IBPGR was established by CGIAR in 1974. The basic function of IBPGR is to promote and coordinate an international network of genetic resources centres to further the collecting, conservation, documentation, evaluation and use of plant germplasm and thereby contribute to raising the standard of living and welfare of people throughout the world.

Financial support for the core programme is provided by the Governments of Australia, Austria, Belgium, Canada, China, Denmark, France, FRG, India, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the UK and the USA, as well as the United Nations Environment Programme and the World Bank.

Introduction

1989 was an important year in the history of IBPGR. Not only did it mark the 15th year since the Centre's establishment; it was also the year in which we moved into new Headquarters premises, made real advances towards attaining an independent status and, at the same time, improved relationships with FAO and the other Centres of CGIAR. The Director of IBPGR announced his resignation in 1989 and Centre staff and Trustees worked together to set a new path for IBPGR's future through the development of a long-term strategic plan. Other significant events are recorded throughout this report and summarized in the Highlights section.

With the growth of the IBPGR programme, and the need, as a result, for a substantial increase in number of staff, the facilities rented by IBPGR from FAO proved to be inadequate in 1989. FAO was not in a position to provide any additional space and in November 1988, the Board agreed to attempt to relocate the entire Headquarters operation of IBPGR. Centre Management started investigating possibilities in Rome in the same month and appointed a staff relocation committee in December 1988 as a means of ensuring full staff participation in the process. With considerable support from FAO, the Headquarters operation was able to move in August 1989 to a renovated building in Via delle Sette Chiese. As IBPGR still operates under the administrative umbrella of FAO, these premises are rented by FAO for IBPGR, but all charges for rent and operation are paid from IBPGR's budget. Office space and facilities no longer place any constraints on IBPGR's operation.

During 1989, the Board of Trustees concluded that IBPGR should become a fully independently administered CGIAR Centre. IBPGR has continued to operate under the FAO administrative umbrella from its establishment in 1974. IBPGR has operated its programme more independently since 1987 when it attained the status of Field Project within the FAO administration. During 1989, the Board of Trustees initiated the search for a suitable Headquarters location for an independently administered IBPGR and the Board is likely to provide its final recommendation to the CGIAR by the middle of 1990.

In the programme area, working relations with FAO greatly improved during

15 years of IBPGR: A Retrospective

Genetic erosion and the need for conservation of endangered plant germplasm became apparent to a few perceptive scientists as early as the 1940s, but it was not until the 1960s that the urgency of the situation received much public attention, mostly as the result of initiatives by FAO and IBP (international Biological Programme).

The first international meeting on plant exploration and introduction was held in July 1961 at FAO in Rome and this was the first international conference dealing with germplasm issues. Two more conferences on plant genetic resources were held at FAO in 1967 and 1973. These last two conferences, organized and sponsored by IBP in collaboration with FAO, resulted in two standard reference publications on crop genetic resoures:

- Frankel, O.H. and E. Bennett (Eds.). 1970. Genetic Resources in Plants – their Exploration and Conservation. International Biological Programme Handbook No. 11. Blackwell Scientific Publications, Oxford and Edinburgh.
- Frankel, O.H. and J.G. Hawkes (Eds.). 1975. Crop Genetic Resources for Today and Tomorrow. International Biological Programme 2. Cambridge University Press.

Other activities around the same time generated a wider understanding the urgent need for plant genetic resources conservation:

- the establishment in 1965 of an FAO Panel of Experts on Plant Exploration and Introduction;
- the establishment by FAO of a Crop Ecology and Genetic Resources Unit in 1968;

1989. IBPGR gave a programme presentation at the third meeting of the FAO Commission on Plant Genetic Resources in April. Interaction between IBPGR staff and FAO plant genetic resources programme staff is frequent and positive. In addition, the basic elements of a Memorandum of Understanding on programme cooperation between FAO and IBPGR were agreed upon in 1989. The final Memorandum of Understanding is likely to be signed next year.

The second meeting of the Inter-Centre Working Group on Plant Genetic Resources, held at IRRI, Los Banos, Philippines in February set the stage for an extremely successful interaction with the other commodity centres. A detailed analysis of the major recommendations emerging from the meeting is provided further on.

In October 1989, after more than a decade as chief executive of IBPGR, Professor J.T. Williams announced his intention to resign as of 28 February 1990. The Board appointed a Search Committee in October to guide the selection of a new Director. Professor Williams will take up a new appointment as Director of the joint IFAR/IBPGR Tropical Tree Crops Programme for a period of two years.

During the latter half of 1989, the Centre started working towards a new long-term Strategic Plan when it appointed a Strategy Group at Headquarters. The Board of Trustees approved the process of development of the Strategy and the timetable proposed by the Group and it is anticipated that a draft Strategic Plan will be available late in 1990.

The year 1990 promises to be at least as exciting as 1989, with further moves towards full administrative independence, the development of the Strategic Plan, the start of the work of the External Programme and Management Review and the likely appointment of a new Director. Throughout this period, we have received tremendous support from our collaborators in National Programmes, FAO, CGIAR, IARCs and many other organizations, and the continued confidence of IBPGR's donors. We hope that we can count on them in 1990 as well

Dick H. van Sloten
Acting Director

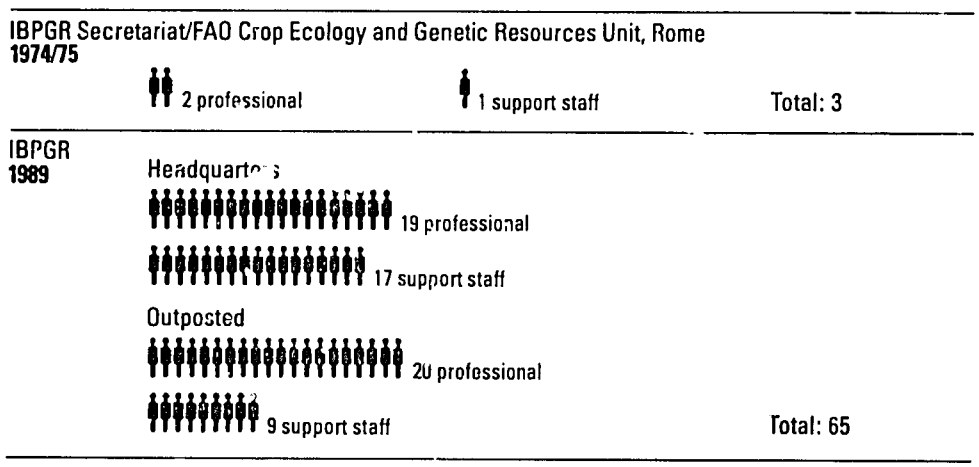
- the inauguration of a postgraduate training course on conservation and utilization at the University of Birmingham, UK, in 1969.

The increased concern for the conservation of plant genetic resources was reflected in the recommendations of the United Nations Conference on the Human Environment, held in Stockholm in 1972, which requested FAO to establish an international programme. Subsequently the CGIAR was requested to consider the possibility of establishing a network of a limited number of centres for the conservation of genetic resources. The result was, ultimately, not the originally proposed network, but the foundation of IBPGR as a new component of the CGIAR.

From its first effective year of operation (1975), IBPGR spread its activities fairly widely, promoting interest and awareness through meetings, publications and training. It functioned through an operational Board serviced by a small Secretariat, housed in and supported by FAO. Initially this Secretariat was headed by Mr R. Pichel, and in 1978 Professor J.T. Williams became the Executive Secretary.

The first ten years of IBPGR saw a slow, but steady, growth of the Secretariat, but essentially no change in its mode of operation. It was still largely an operational Board, acting with the support of Advisory Committees and Working Groups and drawing upon worldwide expertise. After the second External Programme and Management Review in 1985, IBPGR emerged as a CGIAR Centre in its own right, headed by a Director (Professor J.T. Williams), with an internal management structure and a Board of Trustees. Staff numbers

6 Staff numbers – 1974–1989



increased dramatically in the five years following the second review.

It is difficult to summarize the accomplishments of IBPGR over the past 15 years in a few paragraphs, so a few examples are provided which focus on the primary areas of IBPGR's activities.

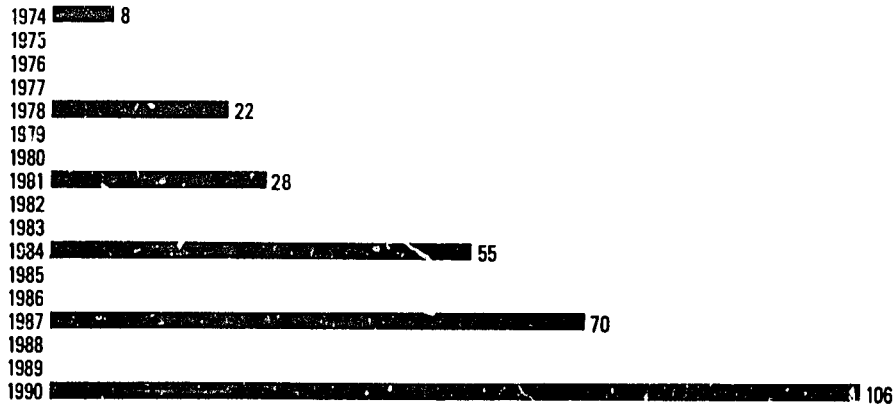
Collecting has been a major task, especially in the early years when massive genetic erosion was occurring as primitive cultivars were replaced by improved varieties (frequently developed by sister CGIAR Centres). Some 188 000 samples were collected between 1974 and 1989. In the early 1980s, emphasis moved from broad collecting of cultivated material to collecting of specific cultivars under threat from genetic erosion, or needed to fill gaps in existing collections. In addition, more attention was paid to collecting a representative sample of wild relatives of cultivated crops and to collecting forages.

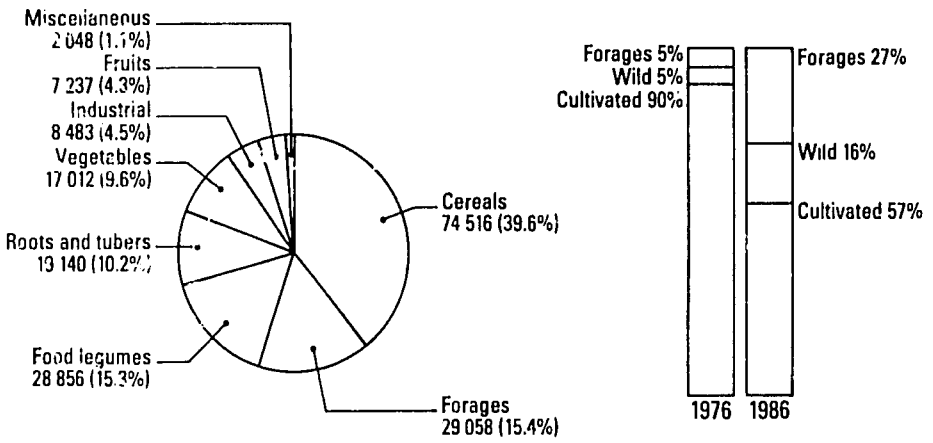
Initially, the IBPGR training programme concentrated on supporting the Birmingham course, which celebrated its 20th anniversary in 1989. Over the years, IBPGR's training programme has become more diversified, including short courses, individual training and Internships. Training courses have been held in most of the major languages: English, French, Spanish, Portuguese, Arabic and Chinese.

IBPGR's scientific and technical support to national genetic resources programmes has grown over the past 15 years, much of it channelled through the expanding network of IBPGR's Regional Offices.

These efforts and those of other IARCs, together with a growing awareness of the need for conservation of plant genetic resources, has led to the establishment of *ex situ* conservation facilities in many countries. When IBPGR was established, the programme envisaged a small number of genebanks, but today it is recognized that most nations of the world wish to establish such facilities within their boundaries. IBPGR considers these National Programmes, together with the genebanks of the IARCs, to be the basic building blocks of

Genebanks – long-term storage facilities (<0°C) 1974–1989





Collecting – cumulative proportions.

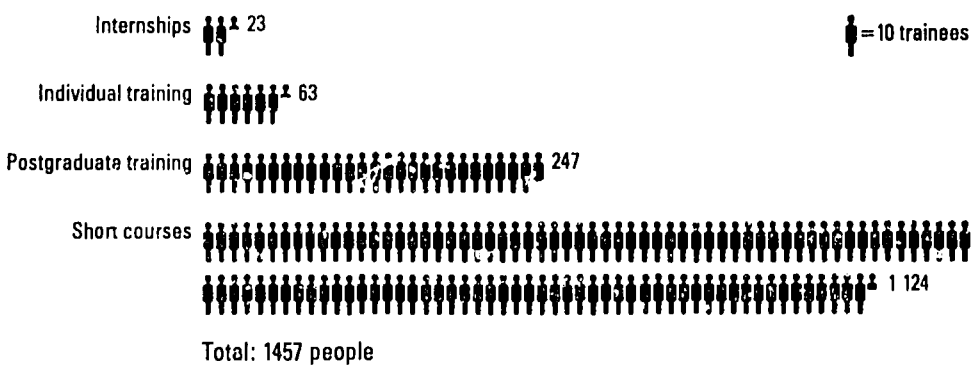
the international genetic resources conservation programme.

IBPGR became involved in research during the first years of its existence. Largely restricted to seed conservation research, this was the beginning of the 'contract-research' approach that has been the foundation of the IBPGR Research Programme. A number of guidelines and handbooks resulted from these early efforts, again mostly in the area of seed conservation. After the second EPR/EMR, the scope of the Research Programme was considerably expanded in the areas of *in vitro* conservation and research on genetic diversity, regeneration and evaluation strategies, and on plant pathology and quarantine in so far as it effects the movement of germplasm. The research programme has generated a set of handbooks and manuals on genebank management, has contributed to the development of a pilot *in vitro* active genebank, and has started the publication of guidelines on the safe movement of selected crops.

Considerable effort has been made in the area of documentation of plant genetic resources over the past 15 years, resulting in the issuance of Directories of Germplasm Collections, standardized descriptor lists and the development of computerized databases. Databases covering a wide range of information are now available for consultation: profiles of national genetic resources systems, *ex situ* germplasm collections worldwide, germplasm collecting carried out with IBPGR support and training supported by IBPGR.

The importance of synthesizing and disseminating information has long been recognized by IBPGR, evidenced by the production and distribution of almost 200 publications over this 15 year period. Public Affairs and a Library Service have received less attention, but these activities should now be strengthened with the appointment of staff respectively in 1987 and 1989.

IBPGR has grown into a full-fledged CGIAR Centre and stands ready to face the challenges of the next 15 years and beyond.



Number of trainees – cumulative from 1974 to 1989

Highlights of 1989

IBPGR celebrated its 15th anniversary in a new Rome headquarters building. Other important events were the decision by the Board that IBPGR should become a fully independent CGIAR Centre and the steps taken towards attaining that status. The development of a draft Memorandum of Understanding on programme cooperation laid the groundwork for a stronger scientific relationship with FAO. In June 1989, the Chairman of the CGIAR appointed a committee to assist in negotiations between IBPGR and FAO concerning the Centre's plans to attain full autonomy and its future administrative arrangements.

After more than a decade as Chief Executive of IBPGR, in October 1989, Professor J.T. Williams announced his plans to resign as Director of IBPGR as of 28 February 1990. He will take up a new appointment as Director of the joint International Fund for Agricultural Research/IBPGR Tropical Tree Crops Programme for a period of two years starting on 1 March 1990.

The second meeting of the Inter-Centre Working Group on Plant Genetic Resources identified a number of areas for collaboration among CGIAR Centres.

During 1989 the first steps were taken to prepare IBPGR's new long-term Strategic Plan. A small Strategy Group was established and a timetable for preparing the Plan endorsed by the Board. Early in 1990 an In-house Review will provide the opportunity for input from both Headquarters and outposted staff.

Administration

Dr W.E. Tossell succeeded Dr W.J. Peacock as Chairman of the Board of Trustees. Two new members joined the Board, Ing R. Sevilla-Panizo (Peru) and Professor L. Monti (Italy), replacing Dr W.J. Peacock and Dr A. Papasolomontos, who resigned in February. The Board elected Professor V.L. Chopra as Vice-Chairman and Professor D.R. Marshall as Chairman of the Programme Committee. A Location Committee, chaired by Professor Marshall, was established to examine Headquarters locations for an independent IBPGR and a Search Committee, chaired by Dr C.F. Murphy, began identifying suitable candidates for Director. The position of Head of Administration and Chief Financial Controller was filled in June, giving the Centre a full complement of Programme Heads.

Communications and Library Services

A Librarian was appointed in October, with plans to develop a leading collection of literature on plant genetic resources to satisfy the needs of external research workers and the Centre's professional staff.

IBPGR's publications strategy was approved by the Board of Trustees at its 16th meeting in February. Among other things, the strategy calls for more multilingual publications, and the investigation of joint publishing ventures.

In 1989, the public affairs office focused on the audience groups best able to generate support for IBPGR's work: those who shape public policy and influence public opinion. The first issue of 'Geneflow', a magazine about plant genetic resources, was published in June. A public awareness campaign in Latin America funded by the Government of Italy will be implemented in 1990 by CIP, CIAT, CIMMYT, IBPGR, Inter Press Services and Diversity Magazine under the auspices of the Public Awareness Association for International Agricultural Research.

Field Programme

IBPGR's network of Regional Offices was completed in 1989 with the establishment of an office for Southeast Asia in Los Baños, the Philippines. Although operational since 1988, the formal opening ceremonies of the offices in New Delhi (for South and Southeast Asia) and Beijing (for East Asia) took place in June 1989.

In 1989, the Field Programme was further strengthened by an Assistant Coordinator for North and Central America and the Caribbean, a Coordinator for South America, an Associate Coordinator for Southeast Asia, and a new Assistant Coordinator for East Asia. IBPGR also now has three Seed Handling Units (SHUs) and three full-time Plant Collectors. In 1989, the SHU in Singapore was formally established in the National University, and negotiations were completed with CATIE, Costa Rica for the establishment of the third Unit. The Unit in Kew, UK has been operational for some years.

Documentation and Characterization

The IBPGR Documentation and Characterization Programme was reviewed in 1989. The review highlighted the importance of central crop databases to global efforts and recommended their further development in cooperative programmes and/or crop networks. IBPGR published a number of descriptor lists in 1989 and supported

eight National Programmes in the purchase of computer equipment. Nine new characterization projects were started.

Germplasm Acquisition

IBPGR sponsored or supported collecting missions in 28 countries, many of them meeting specific needs of National Programmes.

Training

Implementation of the recommendations of the 1988 IBPGR training review began with special attention to national genebanks.

IBPGR supported training for nearly 100 scientists and technicians in the form of postgraduate fellowships, short-specialized technical courses and individual programmes. In December, 11 MSc alumni participated in a refresher course, held at the University of Birmingham, UK and IBPGR Headquarters in Rome, to commemorate the 20th anniversary of Birmingham's MSc International Course on Plant Genetic Resources and the 15th anniversary of IBPGR.

Crop Networks

Work intensified on the crops in the pilot project (barley, maize, sweet potato, groundnut, *Musa*, okra, *Medicago* and *Beta*). However, the concept itself received such general acceptance that work has begun on networks for several other crops, for example, rice, safflower, sesame and soyabean.

Research Programme

In 1989, the Research Programme was further integrated with the overall IBPGR Programme as a regional approach to all Centre activities was adopted.

The Programme was strengthened by the appointment of two staff to coordinate genetic diversity research. They will be joined in early 1990 by a third staff member and a Research Associate who will be based in Mexico.

The first four scientists received grants under the Visiting Scientist Scheme. This scheme allows selected scientists to visit research institutions to collaborate on IBPGR-sponsored research projects.

Seed Conservation Research

IBPGR-sponsored projects on ultra-dry seed storage yielded promising results. Other projects studied the effects of moisture and temperature on seed longevity, preservation techniques for recalcitrant seeds, genetic stability during storage and regeneration, and problems of seed dormancy.

***In vitro* Research**

In 1989, IBPGR continued the development of *in vitro* collecting and storage techniques and investigation of the stability of stored *in vitro* cultures. The IBPGR-CIAT Pilot *In vitro* Active Genebank completed its three-year test of model standards of operation. The two Centres will collaborate to maximize the impact of this study.

The IBPGR *In vitro* Conservation Database project, which began at the University of Nottingham in 1980, formally ended in 1989. A survey of users to determine the best way of meeting current information needs was carried out late in the year.

Plant Pathology and Quarantine

Technical Guidelines for the Safe Movement of Germplasm, co-published by FAO and IBPGR, were produced for *Musa*, cocoa, sweet potato, yam and edible aroids. Meetings were held to develop additional guidelines on legumes and *Citrus*. Other projects included the development of a diagnostic probe for banana bunchy top virus, rapid indexing methods for viruses and non-destructive seed health testing.

Genetic Diversity Research

Early in 1990, the Genetic Diversity Research Programme will be reviewed to determine the direction of the programme for the next five years.

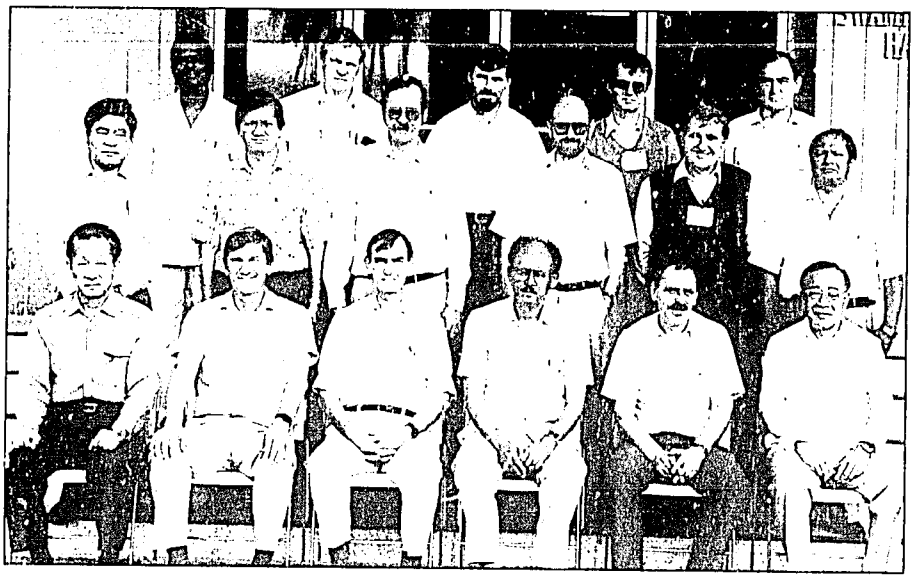
A number of projects on aspects of genetic diversity continued in 1989. New initiatives included an investigation of genetic diversity in *Vigna* and an ecogeographical survey of wild relatives of *Citrus* and mango in Indonesia. Other projects surveyed current information on breeding systems and reviewed the scientific basis for regeneration.

ECP/GR

At its fourth meeting in 1989, the Technical Consultative Committee recommended a Phase IV for ECP/GR from 1990-92, to strengthen its activities within the crop network system. IBPGR has been requested to execute Phase IV of ECP/GR, renamed the European Cooperative Programme on Crop Genetic Resources Networks to reflect more accurately the programme's focus.

Inter-Centre Working Group on Plant Genetic Resources – 1989 Meeting

This group met for discussions at IRRI in February 1989, and made recommendations on a number of topics with the aim to increase inter-Centre collaboration. These are analyzed here in tabular form.



Inter-Centre Collaboration on:		Recommended Action
COLLECTING	Coordination of activities of CG Centres	Centres to communicate plans at an early stage to allow coordination of action
		IBPGR to develop and implement crop network concept
		Inter-Centre missions and IBPGR participation in planning missions
		Collector's manual to be prepared by IBPGR in conjunction with CG Centres
	Follow-up on past collecting work	Examine possibility of establishing database on all past missions
WILD SPECIES	Importance of work by CG Centres on wild species	Continued emphasis on collecting and *ex situ* conservation
		Increased attention to utilization and research to encourage use of material by plant breeders
		Increased funding sought for work on wild species
	Maintaining wild species *in situ*	Preferable to *ex situ* but beyond scope of IARCs
	Increasing understanding of importance of wild species	CGIAR booklet on past utilization as wild species (and their usefulness) - special project funding to be sought
TRAINING	Continuing need for effective training	Continued pooling of training materials and expertise
		Multilingual training materials
		IBPGR to maintain a central database of courses and trainees
		More practical training in areas such as database management
DOCUMENTATION	Total coverage of all existing collections	Compile information on all existing collections in collaboration with NARS
		CG Centres to work to develop global databases for their crops
	Easy availability of global databases through technology	IBPGR to identify minimum standard set of equipment to handle crop databases
		Proposal to be prepared to obtain donor funds for equipment for key NARS genebanks
		Improved bibliographic services

STRATEGIC RESEARCH	Topics for collaboration on bottleneck problems	Non-destructive viability testing Cryopreservation Diversity studies and distribution mapping Core collections for duplicate storage Factors underlying genetic variation under traditional farming systems Stability of seeds in long-term storage Characterization to enhance efficient evaluation Genetic and cytogenetic studies of newly observed variants Genetic erosion during conservation Germplasm regeneration
DUPLICATE STORAGE OF BASE AND ACTIVE COLLECTIONS	Need for duplication of base and active collections	Centres working on same crops should ensure duplicate storage Produce subsets or core collections to facilitate wide duplication Use of permafrost storage in Norway to be pursued
GERMPLASM EXCHANGE	Availability and supply of germplasm	Continued support for CGIAR policy on supply Mechanisms such as MOUs with governments to promote exchange
SEED HEALTH	Phytosanitary standards	CG Centres will adhere strictly to any national legislation CG Centres will use their expertise for additional testing and certification of germplasm for safe exchange
PUBLICATION AND PUBLIC AWARENESS		Support to CGIAR initiative in public awareness, especially Latin American campaign IBPGR publishes for CGIAR 'Partners in Conservation' covering genetic resources activities of all CG Centres
GERMPLASM EVALUATION	Promoting evaluation and enhancement	CG Centres should play a more active and expanded role in evaluation and enhancement especially of wild species Expand research to stimulate germplasm evaluation and enhancement
RELATIONSHIP WITH FAO COMMISSION ON PLANT GENETIC RESOURCES	Promotion of a positive working relationship	Commission could assist in • development of sites for duplication • conservation of germplasm not covered by CG Centres • legal aspects of *in situ* conservation
COLLABORATION OF CG CENTRE WITH NARS	National Programme development	Increase awareness of importance of plant genetic resources within countries Collaborative planning through crop networks Strengthen NARS in technical aspects and training Help NARS in seeking funds Share responsibilities for germplasm preservation
	CG Centre commitment to national interests	Promote in-country conservation by ensuring duplicate accessions are retained in the country of origin Improve rapport through, e.g. evaluation, publishing collaborative findings, organizing workshops CG Centres to consider providing annual statements of holdings status to NARS

FIELD PROGRAMME

In 1989 IBPGR finalized its network of strategically placed Regional Offices (see back cover of this report). In addition to these Regional Offices, IBPGR now has three Seed Handling Units, in Singapore, Kew (UK) and Turrialba (Costa Rica), each with a specific geographic responsibility. Two full-time Plant Collectors are currently based in Cyprus and one in Zimbabwe. For reasons of economy, the office in Washington DC will be closed early in 1990 and the responsibilities of that office will be transferred to the Regional Office in Mexico.

The primary task of the Regional Coordinators is direct contact with National Programmes and the promotion of crop genetic resources networks. This includes assistance to National Programmes in formulating suitable projects for institution building, channelling of proposals to and from IBPGR's Field Programme staff located at Headquarters and the practical hands-on training of staff in national and/or regional genebanks. In the past, IBPGR's Regional Offices were considered to be part of IBPGR's Field Programme, and they reported to the Head of that Programme. However, it has now been recognized that the Regional Offices should seek to link National Programmes with the entire IBPGR programme.

IBPGR Regional Offices

North and Central America and the Caribbean

Until November 1989, Mr L.G. González had the responsibility for the whole of Latin America and the Caribbean, aided by Mr F. Rincón (appointed at the start of the year) as Assistant Coordinator. With the appointment of a Coordinator for South America, Mr González will concentrate his activities in the north of the region.

South America

Dr A.K. Okada was appointed Coordinator in November 1989. Dr Okada is a well-known scientist in the plant genetic resources field. He will continue to be supported by Dr L. López, the Associate Coordinator.

North Africa/ Southwest Asia and Europe

Dr Y. Adham, Coordinator for this region and based at Headquarters, was involved with the development of crop networks for three crops (barley, beet and medics) and travelled in the region giving advice to the National Programmes. The European countries are largely served through the ECP/GR special project.

West Africa

Located in the ICRISAT Sahelian Centre in Niamey, Niger, the IBPGR Office is staffed by a Coordinator, Ms J.A. Toll. During her secondment to Headquarters from April to October, IBPGR Collector Mr A. Bari spent considerable periods in Niger covering the office.

East and Southern Africa

The Coordinator, Mr A.F.Y. Attere, and Assistant Coordinator, Mr H. Kamau are located at ILRAD Headquarters in Kenya. Both attended a number of regional conferences, providing logistical support when required. In May 1989, IBPGR organized, jointly with the National Museum of Kenya and ICRAF, a

training workshop in Nairobi on tree and shrub germplasm collections.

South and Southeast Asia

The Regional Office at the NBPGR campus in New Delhi was formally opened by Ir D.H. van Sloten, Acting Director, IBPGR on 10 June 1989. The Coordinator, Dr J.M.M. Engels has been joined by Dr R.K. Arora as Associate Coordinator for South Asia and Dr L.M. Engle as Associate Coordinator for Southeast Asia, located in the Institute of Plant Breeding of the University of the Philippines, Los Baños.

East Asia

The IBPGR Office in Beijing was also formally opened by Ir D.H. van Sloten on 5 June 1989. The Coordinator, Ms Zhou Ming-De, visited many institutes and organizations and established contact with a number of genetic resources programmes. Mr Cui Yun-Xing resigned during the year as Assistant Coordinator and his position was taken up by Mr Zhang Zongwen, a former IBPGR trainee.

Germplasm documentation and characterization

Development and promotion of standards

In 1989, three external scientists joined IBPGR staff for a review of the documentation and characterization programme. The panel recommended future directions for IBPGR's documentation work, but in general, IBPGR's position in documentation efforts was endorsed.
Specific recommendations are discussed below.

Descriptor lists for mango, oil palm and *Xanthosoma* were published in 1989. Consultations continued on the lists for pineapple, *Brassica* and *Raphanus*, maize, sweet potato, annual *Medicago* species and wild *Arachis* species. Most of these should be published in 1990, as multi-lingual titles. Work continued, in close cooperation with ICRISAT, to revise and publish English and French versions of sorghum, groundnut, pearl millet, small millets, pigeonpea and

Table 1 Characterization projects initiated in 1989

National Hill Crops Improvement Programme, Nepal
Characterization and rejuvenation of Nepalese hill crops collections: finger millet, barley, buckwheat, amaranths, *Panicum miliaceum* and *Setaria italica*. Division of Agricultural Botany, Khumaltar and Royal Botanical Garden, Godawri are cooperating

Agricultural Services, Ministry of Agriculture, Male, Maldives
Characterization and multiplication of germplasm of fruits, vegetables, millets and other crops (over 600 accessions) collected through two missions in 1986 in the Maldives

Institute of Crop Germplasm Resources, CAAS, China
Characterization of extensive collections (1500 accessions) of buckwheat germplasm

Institute of Botany, Academia Sinica, China
Characterization of a world collection of safflower

Institute of Crop Germplasm Resources, CAAS, China
Regeneration of over 4000 accessions of 10 crops listed in 'A Catalogue of Chinese Crop Germplasm for Exchange' co-published by IBPGR in 1987

CATIE, Costa Rica
Characterization of the *Capsicum* world collection (third phase)

INTA, Argentina; IBTA, Bolivia; CENARGEN, Brazil; INIA, Chile; ICTA, Guatemala; DIEAF, Paraguay; Universidad de la Republica, Uruguay; FONIAP, Venezuela
Regeneration of Latin America maize in given countries. The project complements the Latin American Maize Project and the work of CIMMYT and North Carolina State University

INIVIT, Cuba
Characterization of native roots and tubers as a continuation of collecting activities by IBPGR

Florida Sugarcane League, USA
Classification of world collection of sugarcane. IBPGR supported participation of scientists from the Sugarcane Breeding Institute, Coimbatore, India

chickpea descriptors. Acting on recommendations by the review, methods of recording within-accession variability are being investigated to include guidelines for recording this variation in the descriptor lists.

Standardization of data should ideally start during the collecting mission. To facilitate the work of collectors, IBPGR has developed and is testing a computer programme to register data according to the widely used IBPGR collecting forms. This should help to increase the accuracy of collectors' records as well as facilitate incorporation of collecting data in the databases at the institutes/genebanks maintaining the germplasm.

Support to national programmes

IBPGR continues its direct support to genebanks in providing essential computer technology. In 1989, microcomputers and database management software were provided to: China, GDR, Ghana, India, Malaysia, USSR and Yemen PDR. Assistance was also provided to Ecuador.

Available commercial database management software is generally adequate for data entry and simple data processing. However, tailored software can increase the efficiency of data management in a particular genebank. To facilitate the development of such systems, particularly in newly established National Programmes, the review panel recommended that IBPGR should develop a 'tutorial-type' documentation package. Besides functioning as a nucleus of a genebank documentation system, the package can play the role of a computer-based training tool.

Characterization of germplasm collections

Priority in characterization is given to newly collected germplasm and to collections participating in crop networks. Projects initiated in 1989 are shown in Table 1. Many more projects initiated in previous years are in progress (see IBPGR Annual Report 1988).

Directories of germplasm collections

In 1989, work concentrated on revising the voluminous Directories for cereals and vegetables. Both publications will be printed and distributed in 1990. Because of the extremely useful role that Directories play in IBPGR's work, the review recommended their continued publication as well as the finalization of a database on germplasm conserved in genebanks and CGIAR Centres.

Catalogues of germplasm collections

The establishment of computerized databases in genebanks and the wide availability of computers provide a good basis for dissemination of germplasm data on magnetic media, rather than as printed catalogues. IBPGR is encouraging the exchange of either databases or germplasm listings in electronic form and is decreasing its support for the publication of printed catalogues. Genebanks are also being encouraged to publish descriptions and summaries of characterization and evaluation data in scientific journals in lieu of bulky catalogues. Nevertheless, in 1989 support was provided to CIAT to publish a catalogue of *Centrosema* genetic resources. In addition to cross-referenced listings of accessions held in major collections, the catalogue includes maps showing distribution of species.

Comisión Nacional de Recoursos Fitogenéticos of Costa Rica began in 1989 to prepare, with IBPGR support, an inventory of genetic resources within the country.

International crop databases

These databases integrate the passport, and to a varying extent the characterization data on germplasm samples held in dispersed collections. All international crop database projects are, of necessity, long-term undertakings. In general, they perform two functions. They are a useful management tool because they facilitate the assessment of the current status of conservation of

germplasm in base and active collections, identification of duplicates, assessment of the geographical representation and genetic variability in collections, etc. They also provide a more efficient information service to breeders and scientists seeking particular samples. Selected databases are presented in Table 2.

The programme review highlighted the importance of central crop databases in global germplasm documentation efforts and recommended further development of such systems within the framework of the cooperative programmes and/or crop networks.

IBPGR's information systems

For a number of years IBPGR has been developing various databases such as country profiles, and on germplasm collected through field missions, ex-trainees, etc. These are used by the staff to facilitate decision making and to serve the international germplasm community better. Recent years have seen the initiation and/or acceleration of work by different organizations on various databases/information systems which are relevant to genetic resources work. The review advised IBPGR to maintain contact with such projects with the ultimate objective of informing all genetic resources communities of their existence, scope and services.

Table 2 Selected international crop databases in 1989

CIMMYT, Mexico
Maize germplasm in major Latin American genebanks. Software named 'Accession Editor' was developed to facilitate compilation of standardized maize passport data. Later query software will be produced to facilitate the management of this large database

North Carolina State University, USA
Inventory of samples of wild *Arachis* species in major collections in Argentina, Brazil, Colombia, India (ICRISAT) and USA. Project initiated after recommendations of the CIAT/IBPGR/ICRISAT meeting held in Feb. 1989 at CIAT

ICARDA, Syria
Mediterranean forages. Project started in 1987 at IBPGR HQ and continued in 1989 at ICARDA. Particular emphasis is on filling gaps in records received earlier from genebanks in 15 countries
Database on wild species closely related to wheat. The project was initially carried out at IBPGR HQ (in 1988) then moved to ICARDA

University of Southampton, UK
Ecogeographical database for *Vicia faba, Vicia sativa* and their relatives in *Vicia* subgenus *Vicia*. The database will complement the *Vicia* section of the Mediterranean forages system

University of Malaya, Malaysia
Records of *Citrus* spp. herbaria data necessary for studying the distribution of *Citrus* and its wild relatives in southeast Asia. In 1989 IBPGR assisted the University in acquiring a microcomputer

University of Reading, UK
First version of database on primitive cocoa germplasm (initiated in 1988 with support of IBPGR and the Biscuit, Cake, Chocolate and Confectionery Alliance, UK) completed and distributed in 1989. Further development of the system will include information on morphology and disease resistance

ETSIA, Spain
Database on *Cucumis* germplasm. After completion of the documentation of the comprehensive collection at INIA, Spain, the work in 1989 concentrated on collating passport data from other major *Cucumis* collections

Universidad Politecnica, Spain
Database on wild *Brassica* species in the Mediterranean – follow up to collecting missions sponsored by IBPGR

IHAR, Radzikow, Poland
Database for cultivated *Brassica* germplasm maintained in European collections

INIBAP, France
International *Musa* Conservation Network. Development of a *Musa* database to serve the network

Table 3 Collecting activities 1989

	Country	Partner	Accessions
Landraces	**1** Argentina	INTA	Cultivated indigenous varieties of *Solanum tuberosum* subsp. *andigena*, 600 samples growing between 2000 and 4000 m.a.s.l.
	2 Burundi/ Rwanda	IRAZ	39 samples of the local landraces and varieties of beans, sorghum, groundnuts, indigenous cereals
	3 Chile	INIA/CIAT	Local cultivars of *Phaseolus vulgaris*, *P. lunatus* and *P. coccineus*
	4 Costa Rica	Natl Univ. Costa Rica	Maize
	5 Guinea	IRAG	502 legume seed samples (principally *Arachis*, *Phaseolus* and *Vigna* species), 204 samples of *Digitaria exilis*
	6 Kenya	KARI	45 samples of millet, 51 of sorghum, 9 groundnut
	7 Pakistan	NARC	Millets and food legumes, cultivated rice. *Diospyros*, *Ficus*, *Juglans*, *Malus*, *Pistacia*, *Prunus*, *Pyrus*, *Ribes*, *Rubus* and *Vitis*
	8 Papua New Guinea	ODPI PNG Dept Agric. & Livestock	106 banana landraces: 54 thought to be AA diploids, 43 probably triploids, three tetraploids, three Fe's cultivars and three are unknown genomes. 15 specimens from five wild *Musa* species
	9 Peru	INIAA	175 samples from *Oxalis tuberosa*, *Ullucus tuberosus*, *Tropaelum tuberosum*, *Arracacia xanthorriza*, *Polymnia sonchifolia* and *Amaranthus caudatus*
	10 Saudi Arabia	Min. Agric. Water	Landraces of wheat and barley
	11 Yemen PDR	IRCC CIRAD	22 coffee samples, 15 representing the six major coffee types. Seven samples from local variants or very old coffee trees
Wild relatives	**12** East Africa	IJO Tanz. For. Res. Inst. Trop. Pest Res. Inst. (Tanz.) E. Africa Herb. (Kenya)	Kenya/Tanzania, 118 seed samples of *Corchorus*, *Hibiscus*, *Crotalaria* and *Abutilon* Tanzania, 258 samples from elevations 50-2400 m.a.s.l. Tanzania, 160 samples
	13 Bulgaria	ICARDA/Natl Prog.	Perennial legumes, principally *Medicago* and *Trifolium*
	14 China	Triticeae Coll.Prog.	Original landraces of wheat and barley, and of *Elymus* and *Roegnaria* germplasm
	15 Cuba	INIVIT/CIP	Local varieties of genus *Ipomoea*
	16 France	INRA/Utah State Univ.	Perennial *Triticeae*, *Elytrigia juncea* and *E. elongata*, *Agropyron cristatum*
	17 Morocco	IAV Hassan II/WPBS	Wild *Avena* species, including an as yet unnamed species, also *A. damascana* from high altitude
	18 Syria	ICARDA/Univ. Southampton	*Vicia*, *Lathyrus*, *Pisum*, *Lens*, *Medicago*, *Trifolium*, *Lupinus*, *Onobrychis* and *Hymenocarpus*
	19 Yemen PDR	IUCN	*Punica*
	20 USA	USDA, Fac. Agric. Novi Sad, Inst. Field Veg. Crops, VIR	83 samples of wild species of *Helianthus*
	21 USSR	VIR, DSIR, Univ. Southampton	579 samples from 30 taxa
	22 Venezuela	FONIAP	Wild and cultivated *Theobroma*, *T. subincanum* and the wild relative of cocoa, *Herrania* spp.
Forages	**23** Belize	Agric. Dept	91 samples of tropical legume germplasm, principally *Centrosema*, *Desmodium*, *Macroptilium*
	24 Botswana	Agric. Dept	150 seed samples and 400 herbarium specimens
	25 Lesotho	Agric. Dept	African *Trifolium* spp.
	26 Spain	CITA/Univ. Birmingham	196 seed samples
	27 Swaziland	Agric. Dept	205 accessions and 173 herbarium specimens
	28 Zambia	Agric. Dept	185 seed samples

Germplasm acquisition

Germplasm distribution

IBPGR is continuing its collecting programmes throughout the world, particularly in support of the activities of National Programmes (see Table 3).

Two of IBPGR's Seed Handling Units were fully operational in 1989, at RBG, Kew, UK and at the Department of Botany, University of Singapore. The latter was formally established through the signature of a Memorandum of Understanding on 9 June 1989. A third unit, housed in CATIE, Costa Rica, is expected to be completed during 1990. The Unit at Kew continues to operate as an intermediary in the exchange of valuable germplasm. During 1989, 1050 samples were despatched, many being distributed to more than one genebank. 790 samples were in the process of being cleaned. 925 samples from six countries have been received and await collecting data before processing takes place. A number of consignments have been forwarded to the unit in Singapore in order to speed up the cleaning process.

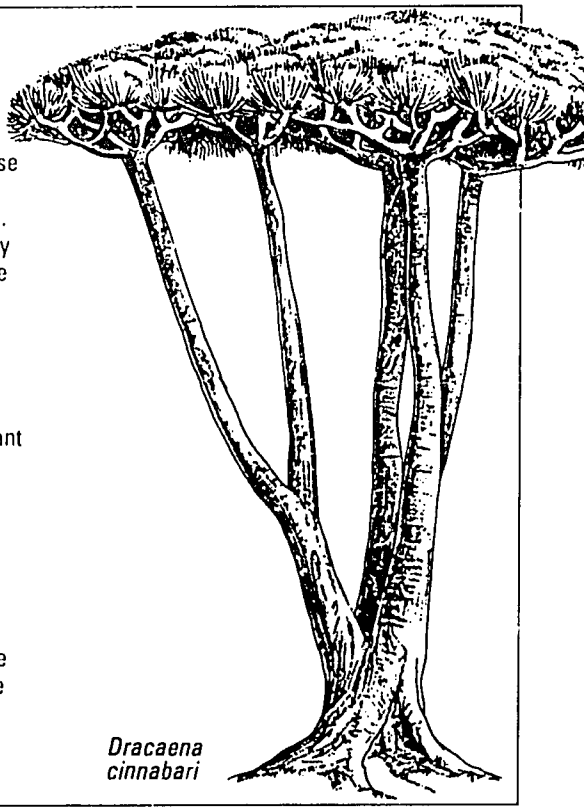
Collecting on Socotra

An IBPGR-sponsored expedition visited the legendary Indian Ocean island of Socotra in 1989, 100 years after the publication of Professor I.B. Balfour's 'The Botany of Socotra'. Socotra, part of Yemen PDR, has been recognized since Balfour's visit as a botanical wonder. 30% of its 700 or so indigenous plant species are endemic; others have restricted, interestingly disjunct or otherwise unusual distributions; many are fascinating curiosities such as the dragon's blood tree (*Dracaena cinnabari*). The flora, however, is still imperfectly known.

Various development projects are planned for Socotra, so a base-line study was needed urgently. In addition to an IBPGR collector and local staff from the Forestry Section, El Kod Agricultural Research Centre, the coordinator of the 'Flora of the Arabian Peninsula and Socotra' project, also took part. Work consisted of collecting herbarium specimens from all areas of the island, completing a checklist of plant species, collecting samples of economically important and useful plants and assessing the status of rare and important endemic species, particularly those mentioned as endangered in the IUCN Plant Red Data Book.

550 herbarium specimens were collected. A preliminary assessment suggested that several of the collected species are new to science. Seed samples of about 40 wild species were also collected. These include the endemic tree *Punica protopunica*, the only known relative of the cultivated pomegranate.

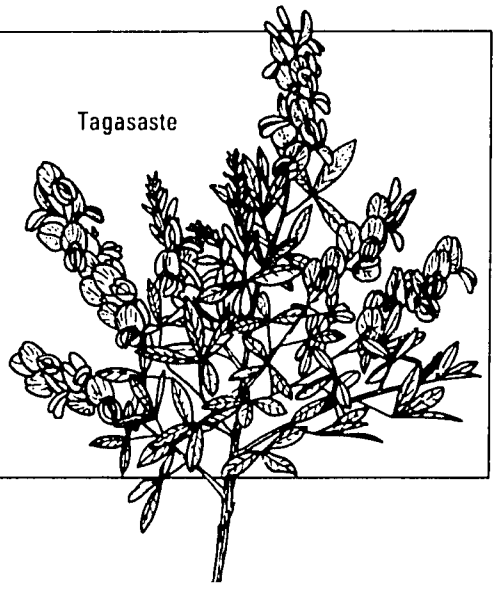
Vegetation data will be digitized at the Global Environment Monitoring System (GEMS), UNEP, Nairobi and incorporated into a geographical database of the island being developed by IBPGR and GEMS which will serve as a guide to future collecting and as a means to measure future changes in the flora.



Dracaena cinnabari

Tagasaste

Tagasaste or tree lucerne (*Chamaecystisus proliferus*) is used as a fodder tree not only in the Canary Islands but in many regions of the world that possess a similar climate. Its potential to increase animal production in areas with a warm Mediterranean climate is only just being realized, but wild populations are becoming increasingly rare. Overgrazing by domestic animals and rabbits have relegated them to inaccessible cliffs. IBPGR supported a team from CITA and the University of Birmingham, UK to visit as many environments as possible on the islands. 196 samples were collected from 184 localities, particularly material from wild populations. Besides the seed samples, the team also collected herbarium specimens, soil samples and *Rhizobium* nodules.



Tagasaste

Crop networks

During 1989 work intensified on the eight crops of the pilot project; barley, maize, sweet potato, *Musa*, okra, *Medicago* and *Beta*. However, the concept of crop networks has received such general acceptance that work on developing networks for several other crops – rice, safflower, sesame and soyabean – has already started.

Progress in 1989

Wild *Arachis* Workshop held in February/March 1989. Inventory of wild *Arachis* germplasm in major collections, finalization of a descriptor list for wild *Arachis*, priority collecting programme. Real interest in creating subnetwork for wild *Arachis* species.

Beta Workshop held in February 1989. CGN International *Beta* Data Base; *Beta* Coordinating Committee (BCC) set up, Dr L. Frese, Chairman. Future activities will include exchange of data (passport and stock, characterization and evaluation), collaborative regeneration of accessions, sharing of collecting activities. The BCC met in June 1989 and launched a project for enlargement of genetic diversity used in sugar beet breeding programmes.

Medics Workshop held in June 1989. Call for International medics Data Base: first step, collating passport data, falls within framework of joint ICARDA-IBPGR project for a Mediterranean Forages Data Base. Other proposals: establishment of mailing list; global medics base collection; *Rhizobium* conservation, etc. Concrete action expected in 1990.

Musa Joint workshop with INIBAP held in December 1989. Global plan of action; documentation, integrated conservation involving *ex situ*, *in situ* and *in vitro*; identification of research needs. Activities to be coordinated by INIBAP: International *Musa* Data Base; preparation of a tool for curators to classify their accessions; network of regional field genebanks; a network for *in vitro* storage; further research on *in vitro* instability, slow growth storage, cryopreservation, etc.

Barley Interim Committee formed, chairman Dr Lehmann. Objectives: integrated documentation system between the five major barley databases: systematic safety duplication of original accessions; implementation of International Data Base for Genes; better coordination on barley RFLP studies; three regional meetings on regional objectives.

Maize Compilation of a genetic resources database for Latin America by CIMMYT was continued.

Okra and sweet potato Planning of regional or global meetings in 1990.

Germplasm conservation

IBPGR has reached agreements with a number of national genebanks, IARCs, regional and other institutions for the conservation of plant genetic resources. Table 4 provides a register of genebanks which have agreed to maintain, for long-term conservation, orthodox seed collections of a large number of major and minor crops. Table 5 shows those institutes which have agreed with IBPGR to maintain field genebanks of vegetatively propagated material.

Base and active collections

To improve storage facilities in national genebanks, IBPGR provided equipment and supplies such as dehumidifiers, chest freezers, aluminium foil bags, sealing machines, seed blowers and seed cleaners to genetic resources programmes in the following countries: Algeria, Bangladesh, Bhutan, Bulgaria, Burkina Faso, Cameroon, Chad, China, Colombia, Costa Rica, Egypt, El Salvador, Guatemala, Honduras, India, Iran, Mexico, Morocco, Nepal, Nicaragua, Niger, Pakistan, Saudi Arabia, Syria, Togo, Tunisia, Turkey, Yemen AR and Yemen PDR.

Table 4 **Base collections of seed crops, which accepted responsibility for long-term conservation**

Crop	Species covered		Scope of collection: Global	Scope of collection: Regional	Institute
Cereals	Barley		●		PGR, Ottawa, Canada
				European	NGB, Lund, Sweden
				African	PGRC/E, Addis Ababa, Ethiopia
				Asian	NIAR, Tsukuba, Japan
			●		ICARDA, Syria
	Maize			*New World*	NPGS, USA
				Asian	NIAR, Tsukuba, Japan
				Asian	TISTR, Bangkok, Thailand
				European	VIR, Leningrad, USSR
				Mediterranean	Portuguese Genebank, Braga Portugal
	Millets	*Pennisetum*	●		NPGS, USA
			●		PGR, Ottawa, Canada
			●		ICRISAT, India
		Eleusine	●		PGRC/E, Addis Ababa, Ethiopia
			●		ICRISAT, India
		Minor Indian millets		*Indian*	NBPGR, New Delhi, India
		Eragrostis	●		PGRC/E, Addis Ababa, Ethiopia
		Panicum miliaceum	●		ICRISAT, India
		Setaria italica	●		ICRISAT, India
	Oats	*Avena*	●		PGR, Ottawa, Canada
			●		NGB, Lund, Sweden
			●		FAL, Braunschweig, FRG
	Rice	*Oryza sativa*			
		indica	●		IRRI, Philippines
		javanica	●		IRRI, Philippines
		japonica	●		NIAR, Tsukuba, Japan
				African	IITA, Ibadan, Nigeria
			●		NPGS, USA
		Wild species	●		IRRI, Philippines
	Rye		●		Polish Genebank, Radzikow
			●		NGB, Lund, Sweden
	Sorghum		●		NPGS, USA
			●		ICRISAT, India
	Wheat	Cultivated species	●		VIR, Leningrad, USSR
			●		CNR, Bari, Italy
			●		NPGS, USA
				Asian	CAAS, Beijing
			●		ICARDA, Syria
		Wild species (*Triticum* and *Aegilops*)	●		Plant Germplasm Institute, University of Kyoto, Japan
			●		ICARDA, Syria

Crop	Species covered	Scope of collection: Global	Scope of collection: Regional	Institute
Food Legumes	Chickpea	●		ICRISAT, India
		●		ICARDA, Syria
	Cicer spp.	●		ICARDA, Syria
	Faba bean	●		CNR, Bari, Italy
		●		ICARDA, Syria
	Groundnut	●		ICRISAT, India
			South American	INTA, Pergamino, Argentina
	Lentil	●		ICARDA, Syria
	Lens spp.	●		ICARDA, Syria
	Lupin	●		ZIGuK, Gatersleben, GDR
			European	INIA, Madrid, Spain
	Pea	●		NGB, Lund, Sweden
			Mediterranean	CNR, Bari, Italy
			Central and East European	Polish Genebank, Radzikow Poland
	Phaseolus Wild species	●		JBNB, Bruxelles Belgium
	Cultivated species	●		CIAT, Colombia
		●		NPGS, USA
			European	FAL, Braunschweig, FRG
	Pigeonpea	●		ICRISAT, India
		●		NBPGR, New Delhi, India
	Soyabean	●		NIAR, Tsukuba, Japan
		●		NPGS, USA
	Wild perennial	●		CSIRO, Canberra, Australia
	Vigna Wild species	●		JBNB, Bruxelles, Belgium
	V. mungo	●		NBPGR, New Delhi, India
	V. radiata	●		IPB, Los Baños, Philippines
		●		AVRDC, Taiwan, China
	V. umbellata	●		NBPGR, New Delhi, India
	V. unguiculata	●		IITA, Nigeria
		●		NPGS, USA
	Winged bean	●		IPB, Los Baños, Philippines
		●		TISTR, Bangkok, Thailand
Root Crops	Carrot	●		IHR, Wellesbourne, UK
	Cassava (seed)	●		CIAT, Colombia
	Solanum spp.	●		CIP, Peru
	Sweet potato (seed)	●		NPGS, USA
			Asian	AVRDC, Taiwan, China
		●		NIAR, Tsukuba, Japan
Vegetables	*Allium*	●		CGN, Wageningen, Netherlands
		●		IHR, Wellesbourne, UK
		●		NPGS, USA
			South and East European	RCA, Tápiószele, Hungary
			Asian	NIAR, Tsukuba, Japan

Crop	Species covered	Scope of collection: Global	Scope of collection: Regional	Institute
Vegetables	*Amaranthus*	●		NPGS, USA
			Asian	NBPGR, New Delhi, India
	Capsicum	●		CATIE, Turrialba, Costa Rica
		●		AVRDC, Taiwan, China
			Asian	NBPGR, New Delhi, India
	Cruciferae *Brassica carinata*	●		FAL, Braunschweig, FRG
		●		PGRC/E, Addis Ababa, Ethiopia
	B. oleracae	●		CAAS, Beijing, China
		●		IHR, Wellesbourne, UK
		●		CGN, Wageningen, Netherlands
	Raphanus	●		CAAS, Beijing, China
		●		IHR, Wellesbourne, UK
			Asian	NBPGR, New Delhi, India
	Wild species	●		Universidad Politécnica Madrid, Spain
		●		Tohoku University, Sendai Japan
	Oilseeds and green manures			
	B. campestris, *B. juncea*	●		PGR, Ottawa, Canada
			Asian	NBPGR, New Delhi, India
	B. napus, *Sinapis alba*	●		FAL, Braunschweig, FRG
	Vegetables and fodders			
	B. campestris, *B. juncea*, *B. napus*	●		IHR, Wellesbourne, UK
	B. napus	●		FAL, Braunschweig, FRG
	All Cruciferae crops		*East Asian*	NIAR, Tsukuba, Japan
	Lactuca spp.	●		IHR, Wellesbourne, UK
		●		CGN, Wageningen, Netherlands
	Okra	●		NPGS, USA
		●		NBPGR, New Delhi, India
	Safflower	●		NBPGR, New Delhi, India
	Tomato	●		CATIE, Turrialba, Costa Rica
		●		ZIGuK, Gatersleben, GDR
		●		NPGS, USA
			Asian	IPB, Los Banos, Philippines
	Southeast Asian vegetables		*Southeast Asian*	IPB, Los Banos, Philippines
	Cucurbitaceae *Benincasa*, *Luffa*, *Momordica*, *Trichosanthes*	●		IPB, Los Banos, Philippines
	Cucumis, *Citrullus*, *Cucurbita*	●		NPGS, USA
	Citrullus, *Cucurbita*	●		VIR, Leningrad, USSR
	Cucumis, *Citrullus*	●		INIA, Madrid, Spain
	Eggplant	●		CGN, Wageningen, Netherlands
		●		NPGS, USA
		●		NBPGR, New Delhi, India

Crop	Species covered		Scope of collection: Global	Scope of collection: Regional	Institute
Industrial Crops	Beet		●		FAL, Braunschweig, FRG
			●		NGB, Lund, Sweden
				Mediterranean	Greek Gene Bank, Thessaloniki
	Cotton			*Mediterranean*	Greek Gene Bank, Thessaloniki
	Sugarcane (seed)		●		NIAR, Tsukuba, Japan
			●		NPGS, USA
	Tobacco			*Mediterranean*	Greek Gene Bank, Thessaloniki
	Jute and Kenaf		●		BJRI, Dhaka, Bangladesh
Forages	Legumes	*Centrosema*	●		CIAT, Colombia
			●		CENARGEN, Brazil
			●		CSIRO, Brisbane, Australia
		Desmodium	●		CIAT, Colombia
			●		CSIRO, Brisbane, Australia
		Desmanthus	●		CSIRO, Brisbane, Australia
		Stylosanthes	●		CIAT, Colombia
			●		CSIRO, Brisbane, Australia
		Leucaena	●		NPGS, USA
		Lotonanis	●		ILCA, Ethiopia
			●		Seed Bank, RBG, Kew, UK
		Macroptilium	●		CENARGEN, Brazil
			●		CSIRO, Brisbane, Australia
		Neonotonia		*African*	ILCA, Ethiopia
			●		Seed Bank, RBG, Kew, UK
		Zornia	●		NPGS, USA
			●		CIAT, Colombia
		Trifolium		*African*	ILCA, Ethiopia
			●		Seed Bank, RBG, Kew, UK
	Grasses	*Cynodon*	●		NPGS, USA
		Cenchrus	●		Seed Bank, RBG, Kew, UK
			●		ILCA, Ethiopia
			●		CSIRO, Brisbane, Australia
		Digitaria	●		ILCA, Ethiopia
			●		CSIRO, Brisbane, Australia
			●		Seed Bank, RBG, Kew, UK
		Pennisetum	●		NPGS, USA
		Paspalum	●		NPGS, USA
		Urochloa	●		CSIRO, Brisbane, Australia
Others	Tree species		●	*(Fuel and environmental stabilization in arid areas)*	Seed Bank, RBG, Kew, UK
	Sesame		●		KARI, Nairobi, Kenya
			●		RDA, Rep. Korea
	Sunflower			*European, Mediterranean*	Research Institute of Plant Production, Czechoslovakia

Table 5 **Field genebanks (active collections for vegetative material) which have accepted responsibility for conservation**

Crop	Species covered	Geographical representation		Institute
		Global	*Regional*	
Roots and Tubers	Cassava	●		CIAT, Colombia
			Central American	INIA, Mexico
			African	IITA, Nigeria
	Sweet potato		*Asian and Pacific*	AVRDC, Taiwan, China
		●		IITA, Nigeria
Fruits	Banana	●		Banana Board, Jamaica
			Southeast Asian	PCARRD, Philippines
			African	DGRST, Cameroon
	Citrus		*East Asian*	Fruit Tree Research Station, Tsukuba, Japan
			Mediterranean	INIA, Valencia, Spain
			Mediterranean and African	IRFA, Corsica, France
			North American	USDA, USA
			Latin American	CENARGEN, Brazil
			South Asian	IIHR, India*
		●	*Subfamily Aurantioideae*	University of Malaya, Kuala Lumpur, Malaysia
Industrial Crops	Cocoa	●		University of the West Indies, Trinidad and Tobago
		●		CATIE, Costa Rica
	Sugarcane	●		Sugarcane Breeding Institute, Coimbatore, India
		●		USDA, Florida, USA
Perennial Species	*Allium*	●	*Short day species*	Hebrew University of Jerusalem, Israel*
		●	*Long day species*	Research Institute for Vegetable Growing and Breeding, Olomouc, Czechoslovakia
	Arachis (wild)		*Latin American*	CENARGEN, Brazil
	Glycine (wild)	●		CSIRO, Australia

*Under discussion or awaiting formal agreement

Training

IBPGR paid special attention in 1989 to human resources development in national genebanks, providing increasingly specialized training in the areas of conservation and utilization. Implementation of the recommendations of the 1988 IBPGR training review was initiated and the database on ex-trainees was copied to the Regional Coordinators for further updating.

Group training

Countries supported through the IBPGR training programme in 1989

■		Algeria
■		Argentina
■		Benin
		Botswana
■		Brazil
■		Burkina Faso
■		Burundi
■		Cameroon
■		Chile
■	•	China
■		Colombia
■		Costa Rica
■		Côte d'Ivoire
■		Czechoslovakia
■		Egypt
■		El Salvador
■		Ethiopia
		Gambia
	•	FRG
■		Ghana
■		Guatemala
■		Honduras
■		India
■		Iran
■		Iraq
	•	Japan
■		Kenya
		Korea, Republic
■		Libya
■		Mali
	•	Mauritania
		Mauritius
■		Mexico
■	•	Morocco
	•	Mozambique
■		Niger
	•	Pakistan
■		Peru
■		Philippines
■		Poland
■		Saudi Arabia
■		Senegal
■		Somalia
		Sri Lanka
■	•	Syria
■		Thailand
■		Togo
■		Tunisie
■		Turkey
■		Uganda
	•	UK
■		Uruguay
■		Yemen AR
■	•	Yemen PDR
■		Yugoslavia

Postgraduate courses
■ Short technical courses
• Individual programmes

MSc degree course

IBPGR continues to offer, in collaboration with the University of Birmingham, UK, postgraduate fellowships to young researchers of National Programmes in developing countries. Eight of the 11 researchers who successfully completed the 1988/89 course for the degree of MSc in conservation and utilization of plant genetic resources were directly funded by IBPGR (Fig. 3, p. 41, IBPGR Annual Report 1988). Eight of the 11 trainees in 1989/90 received IBPGR support (Fig. 1).

Short-specialized technical courses

Nine short courses were organized during 1989 (Fig. 2).

IBPGR supported three trainees from Czechoslovakia, Guatemala and Ethiopia to attend a short course at the University of Birmingham, UK on documentation and utilization of plant genetic resources.

In collaboration with CENARGEN, Brazil, IBPGR organized a training course in Spanish on seed technology for genebanks. Researchers attended from Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Peru and Uruguay.

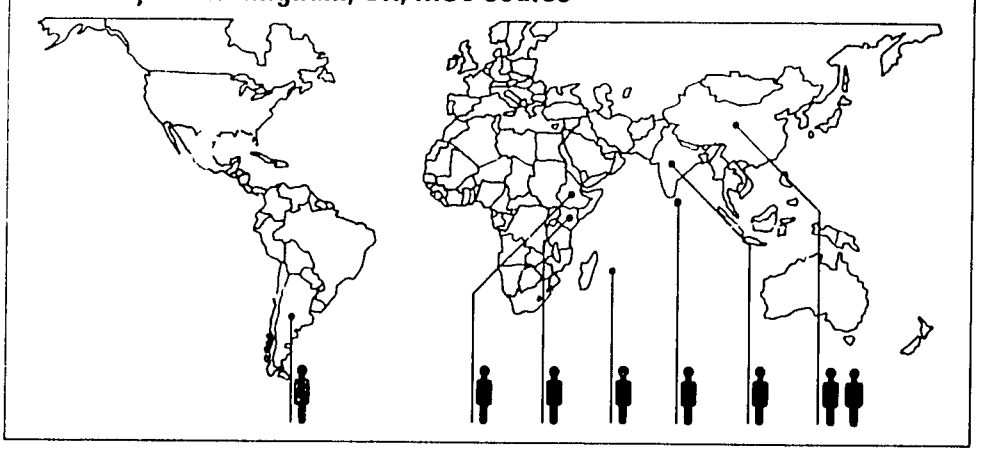
The National Herbarium of Kenya, ICRAF and IBPGR organized a training workshop – targeted to National Programme technicians – on collecting indigenous shrubs and tree species. IBPGR supported two technicians from the National Programmes of Somalia and Uganda.

With the Commonwealth Science Council and NACGRAB, IBPGR held a workshop on standardized methodology for survey and authentication of locally used plant genetic resources in sub-Saharan Africa at NACGRAB, Ibadan, Nigeria. IBPGR supported trainees from Uganda and Ghana.

IBPGR, with the support of UNEP, and the Field Crops Research Institute of Giza, Egypt organized a short course in Arabic on conservation and utilization of food legume germplasm. Participants represented the National Programmes of Algeria, Egypt, Libya, Morocco, Saudi Arabia, Tunisia, Yemen AR and PDR Yemen.

Five researchers from the National Programmes of Morocco and Syria attended a short course on exploration and survey of temperate fruit-tree

Figure 1 **Country of origin of IBPGR-supported trainees attending the University of Birmingham, UK, MSc course**



germplasm held by IBPGR and ACSAD in Damascus, Syria.

IBPGR and UNEP held a training course on characterization and utilization of barley germplasm at the main genebank in Krasnodar region, USSR and in collaboration with the VIR genebank in Leningrad. Barley germplasm workers from Algeria, China, Iran, Iraq, Libya and Turkey participated.

Sixteen technicians with responsibility for seed storage of small/medium germplasm collections and representing National Programmes of Benin, Burkina Faso, Burundi, Cameroon, Côte d'Ivoire, Mali, Niger, Senegal and Togo, participated in a short course given in French on the management of genetic resources collections of seed crops. The course was held by IBPGR and ORSTOM at the ICRISAT Sahelian Centre in Niamey, Niger.

On the occasion of the 20th anniversary of the international MSc degree course on plant genetic resources at the University of Birmingham, UK and the 15th anniversary of IBPGR, an in-service refresher course for MSc alumni was held at Birmingham and IBPGR's new premises in Rome. This was the first time that group training has been held in IBPGR, Rome. The participants, selected to represent a range of specialities, genebank responsibilities, geographic regions and levels of National Programme development, came from Argentina, Brazil, Ghana, India, Kenya, Peru, Philippines, Poland, Thailand, Uganda and Yugoslavia. Two of the alumni – from Argentina and Ghana – are university lecturers and teach component courses on plant genetic resources. During the course, the establishment of the IBPGR Alumni Association was announced. The Association will also be open to all ex-trainees of short courses, internships and individual hands-on programmes. An annual bulletin of IBPGR alumni will be published, in 1990/91, to facilitate communication between alumni and Headquarters as well as among alumni.

Interns
Details of IBPGR's Internships are given in Fig. 3 on p.28 of the Research section of this Report.

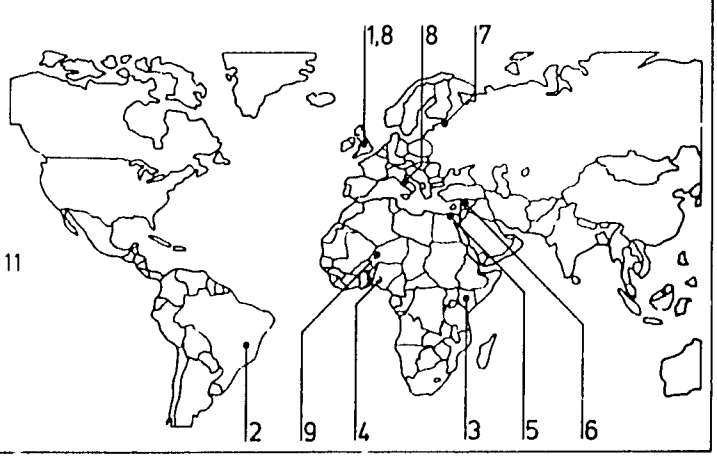
Individual training programmes

Practical on-the-job programmes

To meet the special needs of genebank personnel working in National Programmes in developing countries for well-defined practical skills, IBPGR offers, in collaboration with appropriate international and national institutes, a limited number of practical training programmes. During 1989, two technicians from Pakistan and PDR Yemen worked in genebank management at ICARDA, Syria. A researcher from Mauritania attended practical training at ICRISAT on conservation and characterization of sorghum and millet, and a Moroccan scientist was trained at WPBS, UK on characterization of forage grasses and legumes. A technician from Mozambique received instruction on seed storage techniques for genebanks at ILCA, Ethiopia.

Figure 2 **Location and number of trainees attending IBPGR Short Courses in 1989**

1 Birmingham, UK; 3
2 Brasilia, Brazil; 10
3 Nairobi, Kenya; 2
4 Ibadan, Nigeria; 2
5 Giza, Egypt; 9
6 Damascus, Syria; 5
7 Leningrad, USSR; 8
8 Birmingham, UK and IBPGR HQ, Rome, Italy; 11
9 Niamey, Niger; 16



RESEARCH PROGRAMME

Introduction

In 1988, significant progress was made in developing a Research Programme to complement the already established Field Programme. By the end of 1989, the Research Programme was already becoming an integral part of the IBPGR programme. This is a logical trend. The main reason for the establishment of a Research Programme in IBPGR was to give a stronger scientific basis to the Centre's work. Closer integration with other activities of the Centre is, therefore, an important goal.

During 1989, staff travelled widely to learn about regional problems and identify potential collaborators. These visits allowed for the identification of recurring problems in plant genetic resources and enabled research to be planned with first-hand knowledge of the needs.

New professional staff appointments made or initiated during 1989 will complete a basic coverage of the scope of the programme.

This was a year for consolidating major research themes. A fresh look was taken at the approach to ecogeographic studies, and at the ways in which they might best be used to rationalize germplasm-collecting strategies. A consultant was engaged late in the year to develop and evaluate methods of data analysis prior to a collecting mission, and another was engaged to review and improve IBPGR's practices for collecting and managing voucher specimens. These developments took place in close collaboration with the staff responsible for Germplasm Acquisition.

The first four awards under the IBPGR Visiting Scientist Scheme were made in 1989.

Awards under the IBPGR Visiting Scientist Scheme 1989

Dr Irma Bernal Lugo
National University of Mexico, who visited Boyce Thompson Institute for Plant Research, Cornell University, Ithaca, NY to study effects of ageing on lipid and soluble carbohydrate levels in stored seeds

Dr Sara Spiegel
The Volcani Center, ARO, Bet Dagan, Israel, who will visit Agriculture Canada, Vancouver to test cDNA probe against isolates of strawberry mild yellow-edge virus from different parts of the world.

Mr Zhuang Bingchang
Jilin Academy of Agricultural Science, Hongzhuling, China, who will visit Universita degli Studi della Basilicata, Potenza, Italy to study the effects of differential mortality rates on genotypic frequencies during seed storage.

Dr Fernando Angel
Instituto de Estudios Avanzados, Caracas, Venezuela, who will visit the Biotechnology Research Unit, CIAT, Colombia to carry out genotype characterization and stability monitoring of germplasm maintained in the pilot *in vitro* active genebank.

Genetic diversity

An understanding of genetic diversity in crop genepools is central to the development of effective germplasm conservation and utilization and will help in the development of improved crop germplasm collection and maintenance strategies. To this end, IBPGR has supported work on species mapping, ecogeographical surveys, and diversity studies using morphological and biochemical methods.

During 1989, two Research Officers were appointed at IBPGR Headquarters to participate in the coordination of genetic diversity research. These officers

will be joined by a third staff member in early 1990 who will take responsibility for work on genetic diversity in the wild relatives of crop species. A Research Associate, who will be based in Mexico, was also appointed late in the year to work on genetic diversity in Latin American Cucurbitaceae. He will commence duty in January 1990.

Early in 1990, the genetic diversity programme will be reviewed to establish its direction and content for the next five years. As part of the preparations for the review, staff surveyed reports of past IBPGR-funded projects with a genetic diversity content. Most of the information was found to be descriptive and restricted mainly to agromorphological characters. However, a few projects included multivariate statistical analyses or investigation of variation for isozyme marker genes.

Current projects

A number of projects, funded largely or entirely by IBPGR, were in progress during 1989. Work on collecting wild species included the fourth year of a five-year project to collect and investigate wild grasses related to wheat (Triticeae) in China. An IBPGR Intern (Fig. 3), based at Rennes, France is also investigating interspecific relations and produced a new *Triticum*×*Agropyron* hybrid. His studies also included analysis of B chromosome content in *Agropyron* spp. A meeting of the European collaborators in this project was held in Paris in February 1989 to review the research content of the project and to make preliminary plans for writing a comprehensive final report.

Studies on the systematics of *Thinopyrum sensu lato* being carried out by Utah State University entered their second year. Morphological and anatomical studies were completed and electrophoretic studies done using eight enzyme systems. A highly successful collecting trip in southern France gathered useful germplasm and made observations of direct value in interpreting morphological and anatomical data. Groupings obtained from principal coordinate and cluster analysis of the morphological data showed general agreement with the genomic constitution of the species investigated.

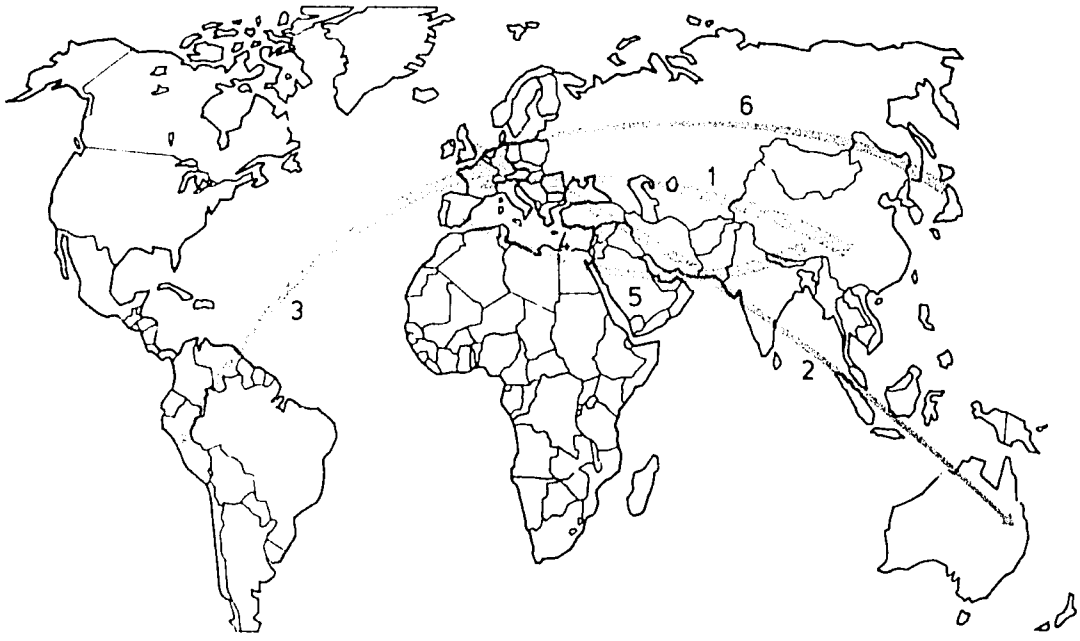
Further progress was also made on the project on the genetic diversity of the Andean tuber crops, *Ullucus tuberosus* (ulluco), *Oxalis tuberosa* (oca) and *Tropaeolum tuberosum* (mashua) undertaken by an IBPGR Intern. Nine enzyme systems were identified which gave sufficiently stained variable banding patterns with leaf and tuber extracts of the plants. About 300 accessions of Ecuadorian and Peruvian ulluco and 200 accessions of oca and mashua were examined. The preliminary evaluation of isozyme data of ulluco largely confirmed the classification of accessions based on tuber morphology and indicated that tuber pigmentation in ulluco is of little genetic significance.

Two pieces of work, funded by IBPGR as part of an 'aggregate project' to upgrade taxonomic knowledge of cultivated species of *Allium*, continued in 1989. These are a taxonomic revision of section *Allium* being carried out at the Royal Botanic Gardens, Kew, UK, and a taxonomic survey of species cultivated in southeast Asia, undertaken by the Rijksherbarium, Leiden, the Netherlands. Both involve efforts to assemble and collate all existing information, as well as produce new information on the species concerned. They are being carried out in cooperation with a comprehensive taxonomic overview and reappraisal of the genus *Allium* which is under way at ZIGuK, GDR.

Research on genetic diversity in cloned material of *Musa* was continued at the University of Georgia/USDA, Georgia, USA. During 1989 a genomic library of *Musa* was constructed to detect nuclear genome RFLPs. The patterns obtained using one of the probes were extremely complex suggesting that the probe had been produced against a portion of repetitive nuclear DNA. Chloroplast and mitochondrial DNA probes from other plant species were used

Wheat

Figure 3 **Activity, location and origin of interns in 1989**



	Activity	Location	Name	Origin of intern
1	Evaluation and use of wild cereal germplasm	INRA, Rennes, France	Chen Qin	China
2	Collecting and disease indexing of *Musa* germplasm	QDPI, Nambour, Australia	S. Sharrock	UK
3	Biosystematics and documentation of minor Andean tuber germplasm	UNA and CIP La Molina, Peru	M. Hermann	FRG
4	*In vitro* collecting of *Prunus* and *Vitis* species	Inst. Agron. Med., Bari, Italy	E. Kamel	Syria
5	Development of shoot-tip grafting of wild relatives of *Citrus* and *Prunus* species to produce disease-free stocks	IVIA, Valencia, Spain	Li Xiancai	China
6	Gene expression during storage of seeds	Wageningen Agric. Univ., Netherlands	Y. Fujikura	Japan

to detect RFLPs in *Musa* organelle genomes to develop a clone classification based on cytoplasmic diversity. Among the 14 *Musa* clones tested a single *balbisiana* and four *acuminata*-type cytoplasms were distinguished.

Work on the development of practical strategies for maintaining variability during regeneration of seed collections of wild *Phaseolus* was undertaken during 1989 as a joint project with CIAT, Colombia. Phaseolin characterization was carried out using seeds from three natural populations from Argentina, Peru and Guatemala. The data obtained on the allelic frequency for the allozymes together with that of phaseolin types will be used to study genetic changes or contamination in the next generation of the three populations.

Considerable problems can be encountered in the effective utilization of plant germplasm because characters of direct interest in crop improvement are particularly subject to environmentally determined variation. One such character is the time taken from sowing to flowering and a project in progress at Reading University, UK uses soyabean (*Glycine max*) to develop an appropriate model to replace the environmentally sensitive evaluation descriptor of time to flower with characterization descriptors that could be used in most environments.

In another project on characterization of plant germplasm, the distribution of cyanide content in the primary and secondary genepools of *Phaseolus lunatus* (lima bean) was studied in collaboration with the Facultés des Sciences, Agronomiques de l'Etat, Gembloux, Belgium. Lima bean has great potential as a food legume but the presence of cyanogenic glucosides (linamarin or phaseolunatin) has hindered its use. 315 accessions of *P. lunatus*, including the cultivated (var. *lunatus*) and wild and weedy (var. *silvester*) forms, were assayed for HCN content. This ranged from 5 to 4385 ppm with extensive variation within each of the cultivated, wild and weedy forms.

New initiatives

A USAID/IBPGR-funded ecogeographic survey of wild relatives of two tropical fruit crops, citrus and mango, was started in Sumatra, Indonesia under a Research Agreement with the Research Coordinating Centre for Horticulture of the Agency for Agricultural Research and Development, Jakarta. IBPGR appointed a Project Manager and Indonesia nominated a Project Coordinator. WWF Indonesia provides administrative support and has an interest in the project as a source of data for developing proposals for *in situ* conservation. Surveying has commenced and early results are promising.

Work on a manuscript on the genus *Mangifera* (mango), undertaken at Bogor, Indonesia and supported by IBPGR, is nearing completion.

A project was initiated in 1989 to consolidate and develop previous work on the genus *Vigna* through an investigation of its genetic diversity as shown in the variation detected in isozymes and chloroplast DNA polymorphism.

IBPGR is aware of the need for better management of the voucher specimens which are collected during IBPGR-sponsored collecting trips and kept as herbarium specimens so that they can be used to verify the names of germplasm samples, in taxonomic studies and for identifying gaps for further collecting. A consultant was appointed to develop appropriate management techniques for IBPGR voucher specimens to ensure the improved utilization of these specimens.

A core collection has been defined as a collection which represents, with a minimum of repetitiveness, the genetic diversity of a crop species and its wild relatives. The increasing size of the world's major crop collections, with the consequent difficulties in their effective utilization has led to considerable interest in the possibility of establishing core collections. Core collections might provide a mechanism for the preliminary screening of large collections for desirable characters, and could be valuable for research.

The successful development of core collections will involve the investigation of a number of scientific issues, including the distribution of alleles in germplasm accessions, the extent to which this distribution is reflected in ecogeographical aspects of species distribution, and appropriate sampling procedures. Management procedures will also have to be determined.

As a first step, work has been started to identify workers involved in the development of core collections throughout the world. This information will be collated and used to guide further study.

A survey of current information on breeding systems has been initiated to lay the groundwork for research on breeding systems relevant to germplasm maintenance and utilization. A review of the scientific basis for regeneration, carried out by Dr L. Breese (Aberystwyth), was published in 1989. The need for crop-specific guidelines is recognized and a survey on regeneration practices commenced as a preliminary step towards work in this area.

Seed conservation

Ultra-dry seed storage

Currently, most genebanks store seeds at −10 to −20°C at 5–7% seed moisture content. However, capital investment and running expenses are relatively high for such storage, especially in tropical areas. IBPGR has played a pioneering role in research into low-cost technology for long-term seed storage, and has supported research on ultra-dry seed storage in China and the UK.

An IBPGR research project on ultra-dry seed storage was started in 1988 at the University of Reading, UK. For many oily seeds, longevity could be increased dramatically by storage at seed moisture contents below 5%. For example, when seeds of groundnut (*Arachis hypogaea*) are stored at 2.0% instead of 5.4% moisture content, the half-viability period increases about 40 times.

Two problems have hindered previous research on this topic. Imbibitional injury can occur when very dry seeds imbibe water rapidly. This is particularly true for large seeds. Damage can also be done during drying. One crop in which these two aspects were confused was pea. The literature states that it is damaging to dry pea seeds below a 10% moisture content. However, experimental results from the University of Reading indicate that, providing that imbibitional damage is prevented, pea seeds can be dried to 3.3% without reducing germination rates. Imbibitional injury can be easily overcome by keeping seeds in a moist chamber prior to germination testing.

The project at Reading also studied storage behaviour of ultra-dry seeds for a total of 23 major crops with orthodox seeds. Based on the germination test, no drying injury was detected in the crops. Furthermore, all the oily seeds tested showed longer storability under ultra-dry conditions than those stored at 5% seed moisture content or above.

Ultra-dry storage is very promising, but further experiments investigating physiology and genetic stability have to be carried out before this technology can be recommended for use in genebanks. A research project on the genetic stability of seeds in ultra-dry storage was initiated at the University of Reading in late 1989.

Another project yielding significant results has been running in the Beijing Botanical Garden, China to study physiological and cytological aspects of ultra-dry seeds. Experimental results indicate that ultra-drying of *Brassica pekinensis* seeds did not induce any significant changes in seed germination and vigour. The ultra-dry seeds were also much more tolerant to ageing treatment than the control, in terms of vigour index and germination. Furthermore, electron microscopic observations indicated that ultra-dry seeds had considerably less irregularity and distortion of cellular ultrastructure than the control after ageing.

Temperature, moisture content and seed longevity

The University of Reading, RBG, Wakehurst Place, and Rothamsted Experimental Station, all in the UK, and the Rijksproefstation voor Zaadonderzoek, in The Netherlands, cooperated to investigate the action of moisture and temperature on seed longevity. These are the two most important factors affecting seed longevity, although the nature of their interaction is not clear. However, an extensive study of experimental data brought out several points.

Firstly, there is no interaction between temperature and moisture content on longevity, if these relations are quantified by the viability equation. Accordingly, the relative effects of moisture content at low temperature should be the same as that at a high temperature. This finding has a great impact on seed storage research, since at low moisture contents the seed survival curve can only be obtained within reasonable periods of investigation at high temperature.

Jackfruit seedlings generated from excised embryos after liquid nitrogen storage. (Photograph by K. L. Tao.)

Secondly, the relative effect of a 10°C reduction in seed storage temperature appears remarkably consistent for different crops.

Findings also strongly support the usefulness of ultra-dry seed storage and reveal a need for modifying the maxim that every 1% reduction in seed moisture approximately doubles the life of the seed, as does each 5°C reduction in storage temperature.

Preservation of recalcitrant seeds

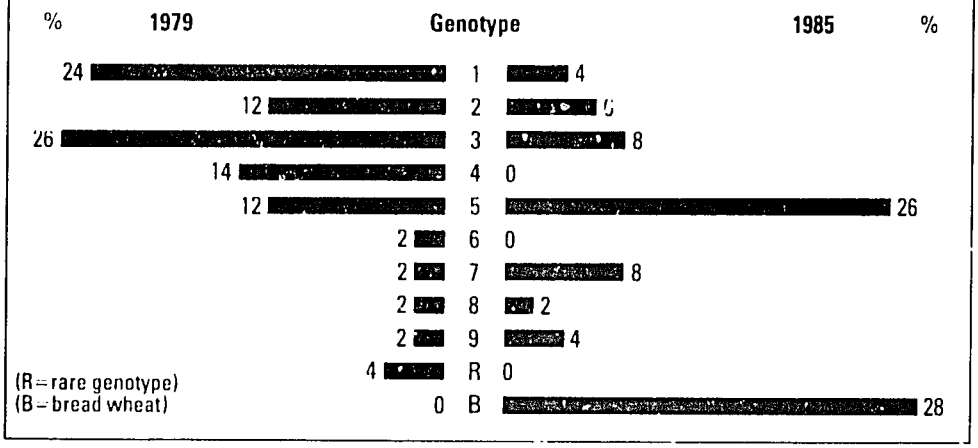
Many major plantation crops, fruit trees and timber species produce recalcitrant seeds which are sensitive to desiccation and low temperature. Appropriate technology for long-term storage of recalcitrant seeds has not yet been developed. IBPGR support continued in 1989 for a project at the University of Agriculture, Selangor, Malaysia that is to develop a preservation technique for jackfruit seeds. The excised embryos from jackfruit seeds at certain maturity levels can be dried to 8% moisture content and retain a viability higher than 80%, but most of them generate abnormal seedlings. Excised embryos with 14% moisture content generate normal seedlings even after liquid nitrogen storage. Although the survival rate after such storage is still low, the cryopreservation of excised embryos is very promising.

IBPGR supported another research project at Zhongzhan University, Guangzhou, China to investigate conservation techniques for longan, lychee and mango seeds and their excised embryos. The mango embryo, in contrast to the jackfruit, is much more difficult to handle since the mango cotyledons contain an unidentified growth inhibitor and the axis darkens and dies. These problems have been overcome so that now the embryonic axes can be dried to 12% moisture content and still retain a viability of 80%.

Genetic stability in seeds during storage and regeneration

A project carried out cooperatively in Italy by the University of Basilicata at Potenza, the Germplasm Institute at Bari, the University of Tuscia at Viterbo, the CNR Institute of Agroforestry at Viterbo, and IBPGR generated exciting and alarming results. Two heterogenous durum wheat (*Triticum turgidum*) accessions, one collected in Italy and the other in Ethiopia, showed dramatic change in composition after being stored and regenerated six times. Fig. 4 shows the change of one durum wheat accession. These results indicate that

Figure 4 **Changes in population composition of Italian durum wheat accession (MG 7983) after six cycles of regeneration.**



particular attention should be paid to the regeneration of heterogenous wheat accessions.

Alteration of DNA sequences following long-term seed storage was studied at Ohio State University, USA. DNA isolation procedures have been developed and applied to single seeds, half seeds or single embryo axes of soyabean. The procedure is a valuable addition to the methodology. Several measurements of qualitative differences in DNA sequences indicate that there is a significant accumulation of single-stranded scissions in DNA isolated from 30-year-old seeds. This is at least 10–100 times the breakage found in DNA from fresh seeds. This deterioration was observed for all of the 30-year-old seeds, but 55–60% of the seeds were alive.

In 1989, IBPGR initiated a project at the Agricultural University, Wageningen, the Netherlands. The project seeks to study changes in gene expression in seeds during storage-induced deterioration and in order to determine how much damage is repairable during imbibition and germination.

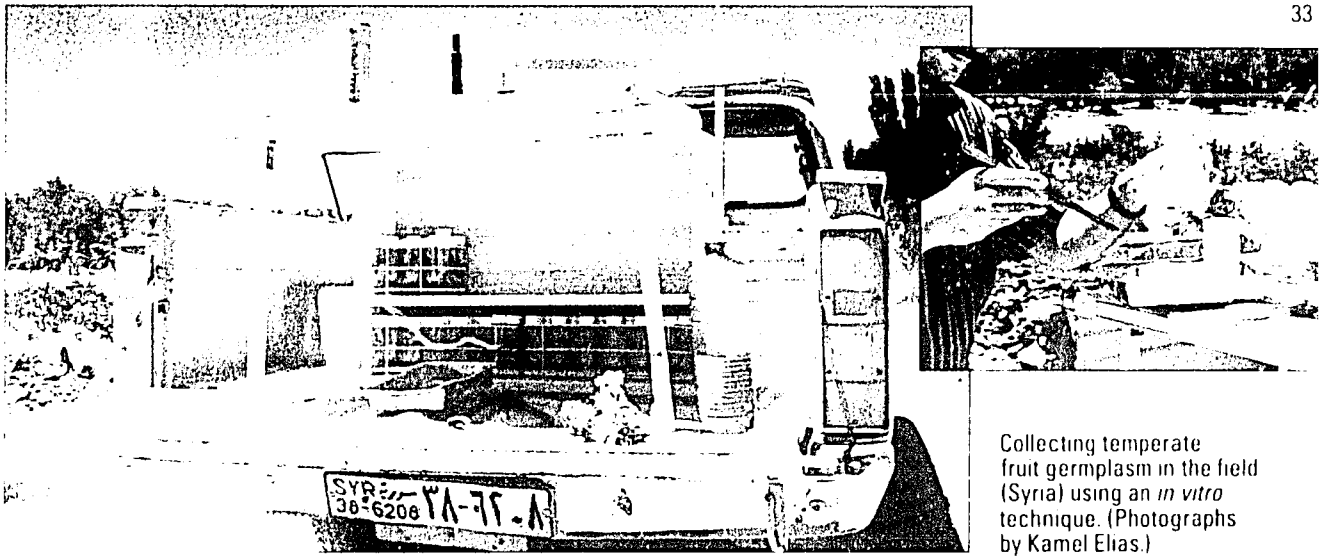
A project carried out cooperatively by the Boyce Thompson Institute, Cornell University, USA, the National University of Mexico and CIMMYT, Mexico is aimed at improving our understanding of the deterioration of seeds in storage, with particular reference to maize. Experiments with restriction enzyme indicated that there were deteriorative changes in the DNA which alter the efficiency of enzymic cutting. This preliminary finding suggested that covalent changes occurred during storage. Experiments aimed at determining the nature of those changes are in progress.

Seed dormancy

Dormancy in seeds causes many problems in germplasm conservation. For example, non-dormant seeds germinate inside seed pods during multiplication and regeneration prior to seed harvesting or during seed drying. Also, dormant seeds cause non-uniform field emergence, which could result in genetic drift in a heterogenous accession during multiplication and regeneration. Dormant seed is also a problem in viability monitoring tests.

IBPGR supported a project at JAAS in Nanjing, China on rape (*Brassica* spp.) seed. The project generated results which provide solutions to the problems listed above.

Tropical forage species often have dormant seeds that fail to germinate during viability testing. A research project at CENARGEN, Brasilia, Brazil broke the dormancy in *Brachiaria brizantha* seeds by removing the seed covers



Collecting temperate fruit germplasm in the field (Syria) using an *in vitro* technique. (Photographs by Kamel Elias.)

and germinating at 20 and 35 C alternating temperature (16h-8h respectively) in 0.2% KNO_3.

In vitro research

IBPGR has continued developing collecting and storage techniques, investigating the stability of stored *in vitro* cultures, testing management procedures for *in vitro* genebanks, and collating and disseminating information on *in vitro* conservation.

In vitro collecting

Simple *in vitro* inoculation procedures that can be carried out in the field provide a valuable alternative procedure for the germplasm collector to use when, for example, seeds are not available or shoots tend to deteriorate in transit. *In vitro* techniques can also be much more efficient and cost effective than conventional collecting, such is the case for coconut.

During 1989, the testing continued in Indonesia of a technique originally developed in Cote d'Ivoire for collecting coconut embryos. Five missions have been carried out by staff of the Research Institute for Estate Crops, Bogor, each mission involving the collecting of five embryos from each of 100 trees. Inoculation in the field led to higher contamination rates than transferring endosperm plugs to the laboratory for embryo inoculation. Although an initial *in vitro* germination rate of 86% was achieved, losses during transplantation and acclimatization reduced the survival rate to between 20 and 30%. Work is continuing to improve the procedure.

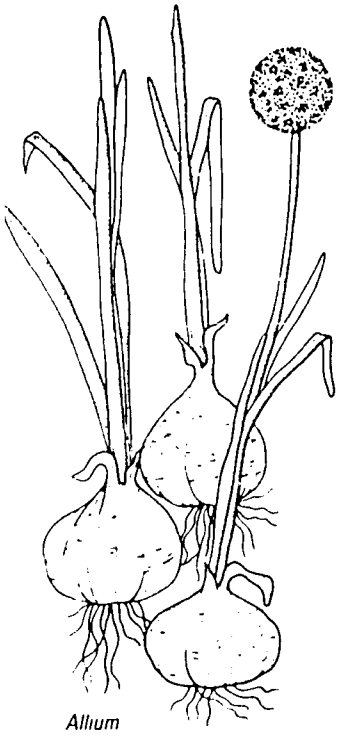
In a collaborative project with ILCA, an *in vitro* technique has been developed and applied to collecting germplasm of the forage grass genera *Cynodon* and *Digitaria*. Cultures have been successfully stored for 200-300 days in slow growth at reduced temperature and transferred between ILCA and CIAT.

An IBPGR Internship (fig. 3) commenced in 1988 at the Istitato Agronomico Mediterraneo, Bari, Italy, involving the development of *in vitro* collecting techniques for *Prunus* and *Vitis*, and continued with the further refinement of collecting and culture procedures and the testing of micrografting to process collected germplasm. The techniques developed in this project were field tested during an expedition in Syria. A wide range of germplasm was gathered including several wild and cultivated *Prunus* species, *Pistacia atlantica*, *Olea* spp. and *Dianthus* sp. (carnations). As well as demonstrating the feasibility of the technique in the field and its ready adoption by collectors inexperienced in

tissue culture work, particular successes were the grafting of collected buds of pear and rooting of carnation shoots.

A collaborative project with CATIE promoted further development, testing and application of *in vitro* collecting. Experience gained using avocado and cacao as models will provide the basis for a specialist training course planned for 1990.

In vitro storage



Allium

In vitro conservation techniques have been investigated in projects on a range of crops for which conservation by seed storage is either unsuitable or impossible. Two of these projects, using *Allium* spp. (the Hebrew University of Jerusalem) and sweet potato (Clemson University, South Carolina, USA) have investigated slow growth at reduced temperatures or in the presence of growth retardants such as mannitol, sorbitol, succinic acid, abscisic acid, paclobutrazole and maleic hydrazide. Although high survival levels were achieved in slow growth storage for periods of at least one year, some problems have been encountered. These included necrosis, vitrification and stunting in sweet potato, and a reduction in the rate of shoot regeneration in *Allium*. Isozyme analysis of *Allium* plantlets propagated and stored *in vitro* generally indicated stability, with the exception of material cultured in the presence of high levels of paclobutrazole. This material exhibited alcohol dehydrogenase band duplication.

Two linked projects conducted in the University of Florida, USA, are investigating the propagation of mango through nucellar somatic embryogenesis and the induction of quiescence in somatic embryos. Ovules of 21 mango cultivars have successfully been introduced into culture. Of these, 12 have produced somatic embryos from the nucellar tissue. Three monoembryonic and three polyembryonic cultivars are being tested for stability of isozyme profiles and morphology in regenerated plants. The ability to induce quiescence in such embryos through, for example, controlled dehydration will be an important step towards developing long-term conservation methods for recalcitrant seed-producing species through the application of artificial seed technology.

Cryopreservation

Regenerating cryopreserved bud of *Prunus* (Dr. C. Stushnoff, Saskatchewan/Colorado)

The greatest promise for stable, long-term *in vitro* conservation lies in cryopreservation. IBPGR projects have investigated this approach to storage for five target crops, with additional projects examining stability in cryopreserved model systems. Dormant buds taken from plants of several species of *Prunus* are relatively easy to cryopreserve and recover by grafting. In a project carried out at the University of Saskatchewan, Canada, differences have been observed between cold-tolerant and cold-tender species. For survival, cold-tender species require controlled acclimatization and desiccation prior to freezing. Cryopreservation would be even more useful in genetic conservation of temperate fruits such as *Prunus* spp. if linked to *in vitro* culture, to take advantage of clonal propagation, disease eradication and germplasm distribution procedures. With this objective in mind, successful attempts have been made both to recover *in vitro* apices dissected and inoculated from buds after cryopreservation, and to cryopreserve cold-tolerant species established as *in vitro* cultures before freezing. The latter, however, require controlled acclimatization.

Shoot-tips of sweet potato (Clemson, South Carolina and Kansas State Universities, USA) show acute sensitivity to certain cryoprotectants. They survived exposure in certain cases to −45°C, but were killed by liquid nitrogen (−196°C).

In a collaborative project with CIAT, cryopreserved shoot-tips of cassava

showed a similar loss of viability at intermediate temperatures. The ability to regenerate plants is lost at a higher temperature (−20°C) than cell survival (−50°C). Other explants are being tested in cassava as subjects for cryopreservation, including the very freeze-sensitive callus and somatic embryos, and the less freeze-sensitive zygotic embryos and seed. Comparing the different explants should both provide insights into the causes of lethal cryoinjury in cassava and indicate means of overcoming it.

Two other target crops for cryopreservation, *Musa* and coconut, further illustrate the emergence of patterns in response to low temperature exposure and the apparent superiority of embryo systems, be they somatic or zygotic. Shoots of *Musa* can survive cooling to temperatures as low as −20°C but not exposure to liquid nitrogen (CATIE). In coconut, effort has been directed at developing a cryopreservation method for immature zygotic embryos for which culture and germination procedures had been perfected in a previous project (IRHO, France/Côte d'Ivoire). Some success has been achieved with embryos dissected six to seven months after fertilization and weighing less than 10 mg.

Stability

Continuing investigations of the stability of stored cultures at the Universities of London (Ontario, Canada) and Nottingham (UK), using maize and potato systems, respectively, continue to provide cautiously optimistic indications of the safety of *in vitro* conservation. However, it is important to note that the final phases of these projects will provide more extensive data based on morphological, cytological and molecular criteria. Large numbers of maize plants have been propagated, grown to maturity and their sexual progeny screened for stability. Continuing experiments will compare the stability of callus-derived embryos. Plants produced from maize caryopses stored in liquid nitrogen tested over a period of two years in the field reveal no variation attributable to cryopreservation.

In the course of refining cryopreservation methods for potato shoot-tips to test subsequent stability, varietal differences were observed in the influence of growth conditions on survival, particularly lighting, before cryopreservation. Such non-cryogenic factors appear to be as important as the cryogenic conditions themselves in determining survival potential.

Pilot *In Vitro* Genebank

In 1989, the IBPGR-CIAT Pilot *In Vitro* Active Genebank project completed its three-year test of model standards of operation. The two Centres are now collaborating to maximize the impact of this study on the practice of medium-term *in vitro* conservation by, for example, producing guidelines based on the project's findings.

Information

The IBPGR *In Vitro* Conservation Database project, which began at the University of Nottingham (UK) in 1980, formally ended in 1989. The project supplied information in the form of printed reports and database searches to scientists worldwide, at a time when *in vitro* research was a rapidly developing field and the need for exchange of unpublished information was great. A consultant recently recommended a survey of users to determine the best way of meeting current information needs; the survey was carried out during the second half of 1989 and the results are being analyzed. Future information-providing activities are likely to include the publication of crop profiles and regional directories of scientists working on *in vitro* culture and conservation.

Dr L.A. Withers, accompanied by Regional Office staff from New Delhi, visited a number of institutes in India and Nepal. The objective was to survey *in vitro* conservation activities and assess opportunities for further involvement

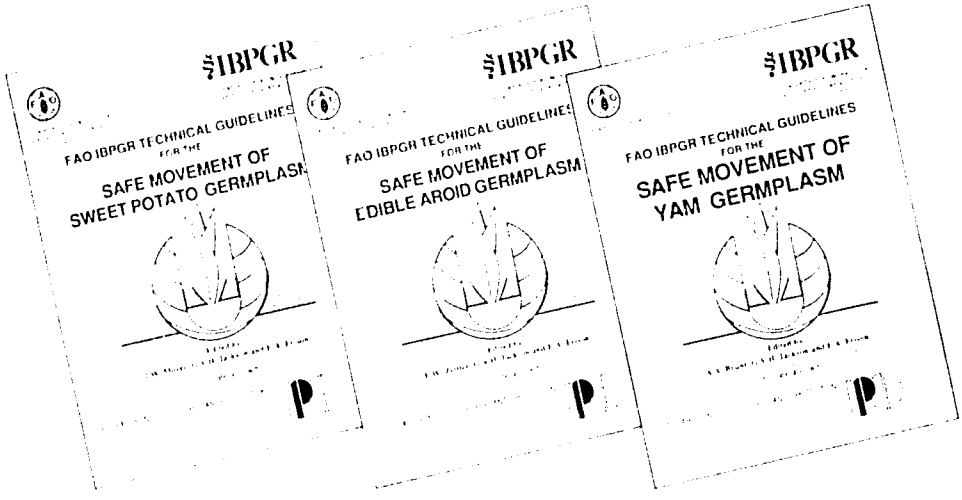
of IBPGR in coordinating of research and collaborating with the National Programmes.

Plant pathology and quarantine

Safe movement of germplasm

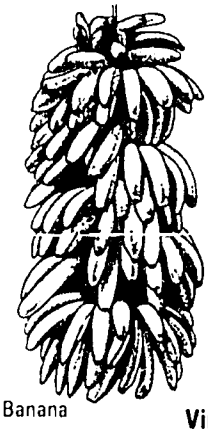
The programme to produce and distribute a series of Technical Guidelines for the Safe Movement of Germplasm, initiated in 1988 in collaboration with the Plant Protection Service of FAO, was well established during 1989. Meetings were held in 1988 to develop guidelines for *Musa*, cocoa, sweet potato, yam and edible aroids. In 1989, these were published and distributed to plant protection services and institutions working with the genetic resources of these crops.

A meeting convened in collaboration with IPO was held in Arnhem, the Netherlands in April 1989, to produce guidelines for legume germplasm. Scientists from 12 different countries attended the meeting, which was sponsored by DGIS of the Netherlands Ministry of Foreign Affairs. A meeting to develop guidelines for *Citrus* was held at Riverside, California in collaboration with the International Organization of *Citrus* Virologists. Experts from seven countries participated.



Therapy and disease indexing research

Diagnostic probe for banana bunchy top virus



Banana

Significant progress was made on a project, based at the Queensland University of Technology, Brisbane, to produce a complementary (c)DNA probe for BBTV. A modification of an existing method was used to purify the virus from plants affected with bunchy top. This revealed small, isometric particles of about 20 nm in diameter. Nucleic acids were extracted and used for cloning into *Escherichia coli*. Screening by the Southern blot technique revealed a nucleic acid clone which hybridized specifically with extracts from infected banana plants.

Treatment of nucleic acid extracted from diseased plants with nuclease enzymes indicates that a single-stranded (ss)DNA species of approximately 1 kbasepairs in size is present in bunchy top-affected banana plants. This is the first time BBTV infection has been associated with an ssDNA virus, previous reports suggesting BBTV to be a luteovirus. Investigations are continuing to discover whether there are two viruses in bananas that cause bunchy top-like symptoms or whether the disease is caused by a complex of two viruses.

Viruses in mango

Electrophoresis of nucleic acid extracts from mango showed two major bands and three minor bands in a project at the Queensland University of Technology, Brisbane, Australia. Nuclease digestion demonstrated the double-stranded nature of four of the bands. Cloning experiments suggest that two of the bands

have high sequence homology with mango chloroplast DNA. The fifth band co-purified with double-stranded RNA. Nuclease digestion tests suggest it may be a viroid. Results from other electrophoretic experiments strongly suggest that the samples contain a viroid-like molecule.

In vitro therapy and indexing of rosaceous fruit crops

A project to develop *in vitro* therapy and crop indexing at the Volcani Center, Bet Dagan, Israel, is yielding interesting results

Peach

Alternating temperatures of 28 and 39°C for 16 days successfully eliminated *Prunus* necrotic ringspot virus from *in vitro* peach cultures. Survival rates reached about 80%. Continuous exposure to 34°C for the same period resulted in 90% survival of the plantlets but with only a slight reduction in virus levels.

Plantlets were better able to survive high temperatures when grown on medium which supports elongation rather than shoot multiplication. Sealing the tubes with polyethylene film markedly reduced the survival of plantlets at 34°C.

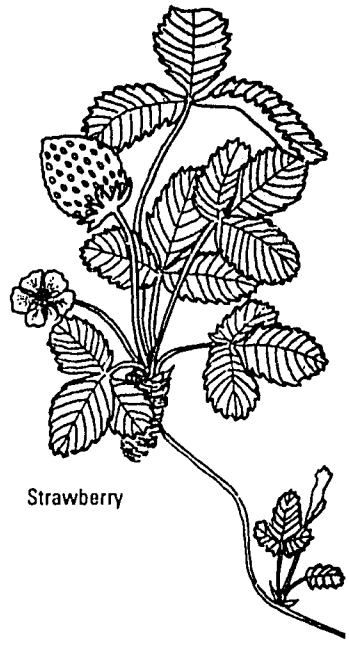
Experiments were designed to optimize the reliability of virus indexing by enzyme-linked immunosorbent assays (ELISA) of *in vitro* growing plantlets.

Strawberry

In vitro thermotherapy experiments with strawberry mild yellow edge virus (SMYEV)-infected strawberry plantlets revealed that an alternating temperature regime of 30 and 38°C stressed plantlets cultured for more than 10–12 days. This coincided with a visible shrinking of the culture medium. Preliminary results indicate that if the agar is replaced by Gelrite, well developed plantlets can survive the alternating temperature regime for 15–20 days.

SMYEV can be detected on *in vitro*-grown plantlets by grafting leaflets from the plantlets on to a greenhouse-grown indicator species, *Fragaria vesca*. Indicator plants grown at very high humidity for 10 days, followed by a gradual reduction in humidity survived very well (above 90%). Viruses were reliably detected on leaves from infected plants (+75% success rate). This test can be used as a preliminary screen, but plantlets which do not induce symptoms in the indicator should be tested further.

The successful transmission of SMYEV to *Rubus rosaefolius* allowed the purification of mg quantities of dsRNA, to be used as a template for preparing complementary DNA probes for SMYEV. Some clones hybridizing specifically with SMYEV were obtained, but further screening for reliability is required.



Strawberry

Rapid indexing methods for viruses

During 1989, a project was initiated at Agriculture Canada Research Station, Vancouver to develop a rapid indexing method for the whitefly component of sweet potato virus disease (SPVD) described from Nigeria. The disease has two components, one which is aphid transmitted and one which is transmitted by a whitefly. Dr H. Rossel of IITA, Ibadan donated three clones of sweet potato for the work. These comprised a healthy clone TIB 8 (H), and the same clone infected with either the aphid (A) or the whitefly (W) component of sweet potato virus. Cuttings from propagated shoots of H, A and W were assayed for viruses by electron microscopy and by analysis for dsRNA. Filamentous virus-like particles could be seen sporadically in leaf tissues of A and W, but electrophoresis of dsRNA extracts showed no distinction between the three sweet potato clones.

Broad-spectrum tests for virus detection

The first approach to developing broad-spectrum tests for virus detection, investigated at Agriculture Canada, Vancouver, has been to try to produce monoclonal antibodies (MCAs) that would detect all viruses of a group. The nepovirus group, which contains a number of economically important

seed-transmitted viruses, was chosen for the study. Indexing for viruses belonging to this group would, therefore, benefit from a broad-spectrum test.

Arabis mosaic virus (AMV), grapevine fan leaf virus (GFLV), tomato black ring virus (TBRV), raspberry ringspot, tomato ringspot and tobacco ringspot were multiplied, purified and used to immunize mice. The preparations were given different treatments before being injected, with the aim of favouring rare or hidden epitopes. In 1989, during the first year of the project, specific MCAs were produced for AMV and TBRV as a by-product of the project.

A second approach has also been taken. A study of sequence homology among tombus-viruses and carmoviruses revealed areas of significant amino acid sequence homology: two sequences of 12 residues within the coat protein gene. Oligopeptides with corresponding sequences have been synthesized and will be used to immunize mice for the production of MCAs.

A short-term project was carried out at the John Innes Institute, Norwich, UK to search a database of ssRNA plant virus nucleotide sequences. No significant regions of nucleic acid homology could be identified, the maximum length of continuous homology being five amino acids. The amino acid sequence of the polymerase gene was the most conserved. From this preliminary study it seems very unlikely that it would be possible to develop a nucleic acid probe that is able to detect a very wide range of viruses.

Non-radioactive hybridization test

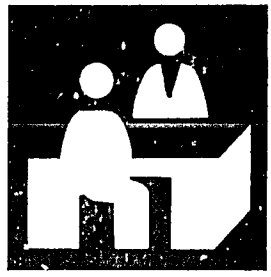
A project was initiated at the John Innes Institute, Norwich, UK to develop a sandwich hybridization test to detect African cassava mosaic virus (ACMV). The experimental approach taken involves the use of two DNA probes that are complementary to the virus target DNA but are adjacent and non-overlapping. The hybridization to the target DNA is carried out in a liquid phase after which one of the probes (capture DNA) allows the DNA to be immobilized in a solid phase. A reporter group attached to the other probe allows the detection of the virus target DNA. During the first nine months of the project, subcloning of the coat protein gene of ACMV was carried out and adaptation of non-radioactive reporter systems was initiated.

Non-destructive seed health testing

Phase 1 of this study, carried out at the Iowa State University, Ames, Iowa in 1988, established the feasibility of developing non-destructive assays. During that phase, various seed-assay techniques and their effects on subsequent germination were evaluated. Assay techniques included short-duration soaking of seed to leach out pathogens, tissue biopsy from dry and softened seed, and short-duration incubation of seed on semi-selective media.

In the second year of research, experiments focused on refining biopsy methods and non-destructive assay techniques. The use in seed biopsy of partial imbibition, embryo coring and technique modifications for large- and small-seeded crop species were evaluated. Also, non-destructive assays were developed for fungal pathogens of maize, and the assay for soyabean mosaic virus of soyabean was further tested.

OFFICE OF THE DIRECTOR



Trustees

Immediately following the 16th Board meeting in February 1989, Dr W.J. Peacock handed over the Chairmanship of the Board of Trustees to Dr W.E. Tossell. Dr Peacock's term as a Trustee terminated at the end of February and his place was taken by Ing R. Sevilla-Panizo from Peru. Another vacancy was created when Dr A. Papasolomontos resigned as Trustee as of 25 February 1989. This position was filled by Professor L. Monti from Italy who was elected to serve for a three-year term as of 25 February 1989. The Board elected Professor V.L. Chopra as Vice-Chairman and Professor D.R. Marshall as Chairman of the Programme Committee. A number of changes were agreed upon in the composition of the Executive Committee, the Programme Committee and the Nominations Committee.

During the 17th Board meeting in October 1989, a Location Committee and a Search Committee were established. The Location Committee, chaired by Professor Marshall, was asked to develop a shortlist of the most preferable countries for the Headquarters of an independently administered IBPGR. In view of the resignation of Professor J.T. Williams as Director of IBPGR, the Search Committee under the Chairmanship of Dr C.F. Murphy started its work in identifying suitable candidates for IBPGR's directorship.

The 16th Board meeting was held in Rome 22–24 February 1989. The 17th Board meeting took place in 1989 in Washington DC, on 23 and 24 October. The Executive Committee met twice, on 20–21 February in Rome and 29 and 30 May in Canberra, Australia. The Programme Committee met in Rome 11–13 September and in Washington DC on 25 October. The Nominations Committee met on 21 February in Rome and again in Washington DC on 24 October.

In 1989, observers from Australia, Denmark, FRG, Japan, the Netherlands, Spain, the USA and representatives of TAC, the TAC Secretariat and the CGIAR Secretariat attended meetings of IBPGR's Trustees.

Headquarters agreement

As reported in the 1988 Annual Report, an amended agreement was signed with FAO for the administration of IBPGR during 1989 and 1990. This included, for the first time, the payment of rent and an overhead of 5% on expenditures to FAO.

Taking into consideration the space requirements of IBPGR, and FAO's difficulty in providing sufficient space, in November 1988 the Executive Committee agreed that IBPGR should seek new premises outside the FAO complex. Suitable premises were found and the entire IBPGR Headquarters operation moved to Via delle Sette Chiese 142, in August 1989. As IBPGR is still operating under the administrative umbrella of FAO, these premises are rented by FAO for IBPGR, but all charges for rent and operation are paid from IBPGR's budget.

During the 16th Board meeting the Trustees adopted a motion that the further development of IBPGR as a fully autonomous, independently administered CGIAR Centre would greatly enchance its capacity to carry out its scientific mandate and its ability to attract strong and continuing financial support. This recommendation was brought to the attention of the CGIAR

during both the mid-term meeting in Canberra, Australia (29 May – 2 June) and International Centres Week in Washington DC, USA (30 October – 3 November).

To assist in the negotiations between FAO and IBPGR for a fully independent IBPGR, the Chairman of the CGIAR appointed a Committee on IBPGR, chaired by Dr Nyle Brady. This group, better known as the 'Brady Committee', met with representatives of FAO and IBPGR on 3 August and 28 October. The work of the Brady Committee has greatly assisted the dialogue with all parties concerned and will continue to play an important role in determining future administrative arrangements for IBPGR.

IBPGR initiated the development of a Memorandum of Understanding between FAO and IBPGR on programme collaboration to ensure that an administrative separation from FAO would strengthen rather than weaken the relationship between the two organizations. A draft was approved by the Trustees on 24 October 1989 and this agreement should be finalized in 1990.

In February 1989, during the 16th Board meeting, the Board of Trustees decided in principle to accept an offer from Denmark to host IBPGR's Headquarters. Subsequently, offers were received from Switzerland, France and Italy. After further consultations with CGIAR, TAC, representatives of developing countries and the 'Brady Committee', the Board agreed at its 17th meeting to re-examine the issue of IBPGR's Headquarter location. During this meeting, a Location Committee was established with the task of developing a shortlist of preferred localities. The Location Committee will meet early in 1990 and report to the 18th Board meeting in March 1990.

Staffing

After more than a decade as chief executive, Professor J.T. Williams announced late in 1989 his resignation as Director of IBPGR, effective 28 February 1990. During Professor Williams' absence on extended duty travel from 1 April 1989, his work was taken over by Ir D.H. van Sloten, who will also serve as Acting Director in 1990 until a new Director has been appointed. Professor Williams will take up an appointment as Director of the joint IFAR/IBPGR Tropical Tree Crops Programme for a period of two years, starting 1 March 1990.

The position of Head of Administration and Financial Controller was filled in June with the appointment of Mr R.H. Dery. This appointment filled the complement of Programme Heads.

A substantial number of support staff were appointed to Administration to cope with the operation of an independent Headquarters building. The Communications and Library Services Programme was strengthened with the appointment of Ms J.A. Dearing as Librarian in October. In 1989 a decision was made, largely for reasons of economy, to close the Liaison Office in Washington DC, USA. The Office will be closed early in 1990 and responsibilities transferred to the Regional Office in Mexico.

1989 appointments in the Research Programme included two professional positions at Headquarters, Dr R. Rao for genetic diversity research and Dr T. Hodgkin as molecular biologist.

Only a few changes in staffing occurred in the Field Programme in 1989. Dr K.A. Okada was appointed in October as Coordinator for South America in the IBPGR Office in CIAT, Cali, Colombia. The Office in New Delhi was strengthened on 1 January 1989 with the appointment of Dr R.K. Arora as Associate Coordinator for South Asia. At the request of the Regional Committee for Southeast Asia, an Associate Coordinator (Dr L.M. Engle) was appointed to deal specifically with coordination of activities in southeast Asia. Dr Engle is based at IPB, Los Baños, Philippines. In December Mr Yun-Xing returned to the

Institute of Crop Germplasm Resources in Beijing and his position as Assistant Coordinator for East Asia was taken over by Mr Zhang Zongwen.

Administration and Finance

With the move to 'semi-independent' premises, IBPGR's administration has become more and more self-supporting. Most of the administrative support previously provided by the Plant Production and Protection Division of FAO is now being handled by IBPGR's own administration. The Centre still relies on general back-up services provided by FAO however, such as personnel, travel, visa, etc., and IBPGR still operates within the rules and regulations of an FAO Field Project.

The 'essential' programme of IBPGR was fully funded in 1989. Several donors also contributed to the 'desirable' programme (or Special Project Funding). Details can be found in the financial report on the next pages.

Communications and library services

Public Affairs

IBPGR has always included an important communications function in its activities: the production and dissemination of scientific and technical literature to the genetic resources and related scientific communities. Two years ago, IBPGR set an objective to supplement its publications activities with a public affairs programme designed to reach an even wider audience. Since that time, the public affairs office has sought to raise the general awareness in both donor and client countries of the importance of plant genetic resources to sustainable agricultural development.

The basis for the public affairs strategy is the assumption that the capacity to build confidence in the aims and activities of the Centre is linked to its ability to attract greater support for its work and for plant genetic resources work in general. The need to foster this support has become particularly critical in an era of shrinking foreign aid budgets, growing bilateralism, greater competition for funds, and public disaffection with many international development agencies.

In 1989, the public affairs office focused its activities on the audience groups best able to generate support for IBPGR's work: those who shape public policy and influence public opinion. The inaugural issue of 'Geneflow', a publication about plant genetic resources, appeared in June 1989. Geneflow was developed for policy makers, non-governmental organizations and conservation organizations with a proven interest in plant genetic resources, and the magazine has been widely circulated within these groups. Funding is being sought for a second issue. Geneflow will be published in Spanish by IBPGR in 1990 for use in the Latin American public awareness campaign described below.

Recognizing the fact that a coordinated approach to promoting ideas and issues can be both powerful and cost effective, IBPGR has been a member of the Public Awareness Association for International Agricultural Research since its creation in 1988. The Association consists of representatives of IARCs, donors and national support programmes. Its mission is to enhance the public awareness capacities of its members, integrate them when possible and, in the process, encourage the development of a global public awareness programme for international agricultural research.

In 1989, IBPGR was involved in the development of a pilot public awareness project on plant genetic resources in Latin America. The initiative, carried out under the auspices of the Association, seeks to heighten awareness and understanding of the significance of plant genetic resources to the sustainability of Latin American agriculture. The primary targets of the project are Latin American policy makers and those who influence them, for example the media in certain Latin American countries. Funding has been received from

Dr Rosina Salerno, representative of IBPGR's host country, Italy, accepts a framed cover of the inaugural issue of Genaflow, during its launch in June 1989

the Government of Italy, and the project will be implemented in 1990 by Inter Press Cooperative Society, a communications network covering more than ninety countries, and Genetic Resources Communications Systems, the publishers of Diversity magazine, with assistance from IBPGR, CIP, CIAT, CIMMYT and the CGIAR Secretariat.

The International Agricultural Research European Service or INTAGRES, another initiative of the Public Awareness Association, was established in 1989 in response to the need, expressed by the Government of Italy, to increase local public awareness of agricultural research. Based in Rome, INTAGRES is cooperatively managed by IBPGR and ISNAR.

In 1989, on the request of the Inter-Centre Working Group on Plant Genetic Resources, the public affairs office produced a booklet, 'Partners in Conservation', which describes the activities of the ten CGIAR Centres directly involved in plant genetic resources. An Italian translation, funded by the Government of Italy and prepared by INTAGRES, will be produced by IBPGR in 1990.

In addition to these activities, the public affairs office in 1989 provided IBPGR Headquarters and outposted staff with conference displays, posters and other information materials. Displays were prepared in English, French, Spanish and Arabic.

Publications

The 16th meeting of the Board of Trustees considered the draft strategy on publications produced by the 1988 In-house Review on Publications. Major points in the approved strategy direct IBPGR to:

- continue a programme aimed at informing the world's plant genetic resources community of practical and scientific developments;
- continue to target its publications primarily at national genetic resources programmes, CGIAR Centres and the wider scientific community;
- continue its policy of free distribution of publications to libraries of genebanks, university departments, research institutions, etc., as well as qualifying individuals;
- investigate producing translations of publications in French, Spanish, Arabic and Chinese;
- investigate joint ventures with other publishers as a means of facilitating the production of publications beyond the capabilities of IBPGR.

The In-house Review and the Board recognized the need to restructure and revise the existing mailing list. Consequently a consultant was engaged to develop a new structure for the list, and the time-consuming process of revising the addresses themselves started, with the aid of the Regional Coordinators. By the end of the year, an impressive reply rate of 60% had been recorded from the regions canvassed. Work on this project will continue in 1990.

A number of translation projects were started in 1989. In particular, drafts were finalized of several descriptors, e.g. maize, to be produced as one publication in English, French and Spanish, a method that is much more economical than issuing separate publications in each language.

Library

The Librarian arrived at Headquarters in October and immediately began the mammoth task of organizing the collection of books, reports, journals, reprints and other documents that had accumulated over the last 15 years. It is intended that the Library will develop into a leading collection of the rapidly growing literature on plant genetic resources. Its immediate role will be to satisfy the information needs of IBPGR professional staff. However, services and facilities will also be available to external research workers.

Titles published in 1989

General
Annual Report 1988

Newsletters
FAO/IBPGR Plant Genetic Resources Newsletter No. 75/76
IBPGR Newsletter for Asia and the Pacific No. 1
IBPGR Newsletter for the Americas No. 1

Training
IBPGR Training Courses: Lecture Series. 2. Scientific Management of Germplasm: Characterization, Evaluation and Enhancement, H.T. Stalker and C. Chapman (eds.)

Characterization and documentation
Descriptors for Mango
Descriptors for Oilpalm
Descriptors for *Xanthosoma*
Directories of Germplasm Collections
- 1.I Food Legumes
- 5.II Industrial Crops
- 6.II Temperate Fruits and Tree Nuts

Research
Practical Manuals for Handling Crop Germplasm *In Vitro*. 2. Shoot-Tip Culture for the Propagation, Conservation and Exchange of *Musa* Germplasm, D.R. Vuylsteke
Systematic and Ecogeographic Studies on Crop Genepools. 3. Races and Populations of Maize in Yugoslavia: Isozyme Variation and Genetic Diversity. I. Geric *et al.*
FAO/IBPGR Technical Guidelines for the Safe Movement of Germplasm (Binder)
- *Musa*
- Cocoa
- Sweet Potato
- Yam
- Edible Aroid

ECP/GR
Report of a Working Group on *Prunus*
Report of a Working Group on Sunflower

Public Affairs
IBPGR en Afrique (brochure)
CGIAR Policy on Plant Genetic Resources
Geneflow
Crop Networks – Geneflow reprint
Partners in Conservation – Plant Genetic Resources and the CGIAR System.

No. books despatched[1]		Requests received
71	Argentina	42
25	Australia	17
9	Belgium	9
69	Brazil	52
32	Canada	28
217	China	15
138	Colombia	32
6	Congo	6
189	Costa Rica	156
12	Côte d'Ivoire	9
24	Czechoslovakia	24
45	Cyprus	28
4	Denmark	4
3	Ethiopia	3
8	Fiji	8
6	Finland	4
54	France	35
22	FRG	22
30	Gambia	28
18	Ghana	17
58	Guatemala	54
5	Guyana	5
4	Hungary	4
217	India	43
38	Indonesia	32
46	Iran	42
10	Iraq	10
7	Italy	7
227	Kenya	199
9	Madagascar	9
38	Malaysia	23
3	Malta	3
194	Mexico	102
7	Nepal	7
6	Netherlands	6
5	New Zealand	5
75	Niger	41
47	Nigeria	34
7	PNG	7
39	Peru	29
244	Philippines	148
8	Poland	8
42	Portugal	5
13	Somalia	12
7	Spain	7
7	Sweden	7
3	Switzerland	3
25	Syria	12
5	Taiwan, China	3
15	Tanzania	13
7	Trin. & Tobago	7
8	Tunisia	6
94	Turkey	56
140	UK	85
523	USA	296
8	Uruguay	5
3	USSR	3
2	Yemen PDR	2
11	Yugoslavia	11
6	Zambia	6
58	Zimbabwe	49

[1] Number of publications despatched from Headquarters. In addition all Regional Offices also distribute IBPGR publications.

IBPGR Staff in 1989

Office of the Director

Prof J.T. Williams*
Director

Miss D.E. Quaye [1]
Secretary to the Director

Ms S. Ebel [2]
Secretary to the Director

Administration

Mr R.H. Dery [2]
Head of Administration and Financial Controller

Ms J. Nunan
Secretary

Mrs C. Gorelli
Programme Officer

Ms M.G. De Angelis [1]
Clerk

Ms O. Youdovich [2]
Clerk

Mr R. Bonsignore [2]
Clerk

Mr M. Beltramme [2]
Clerk

Mr S. Scategni [2]
Driver

Research programme

Dr A. McCusker
Head

Ms C. Zanettin
Secretary

Ir E. Frison
Plant pathology and quarantine

Prof. K.-L. Tao
Seed conservation

Ms H. Shelton [2]
Secretary

Dr L.A. Withers
In vitro conservation

Field programme

Headquarters

Ir D.H. van Sloten [3]
Head

Ms M. McArthur-Giannini
Secretary

Dr W.G. Ayad
Training

Ms D. Piergentile [2]
Secretary

Dr M. Perry [2]
Information

Mr J. Konopka
Documentation

Ms M. Bonomi
Computer Operations Clerk

Mr R. Reid
Germplasm acquisition

Ms S. Bounford
Secretary

Regional Offices

East Africa
c/o ILRAD
Nairobi
Kenya

Mr A.F.Y. Attere
Coordinator

Mr H. Kamau
Assistant Coordinator

Mrs R. Wanjiru Hassane
Secretary

Mr J. Gaithuma
Driver

West Africa
c/o ICRISAT Sahelian Centre
Niamey, Niger

Ms J.A. Toll
Coordinator

Mme Ayele N'Diaye [1]
Secretary

Mr Abel Soubeiga
Driver

Meso America and the Caribbean
c/o CIMMYT
Mexico

Mr L.G. Gónzalez
Coordinator

Mr F. Rincón
Assistant Coordinator

Ms A. Castillio [1]
Secretary

South America
c/o CIAT
Cali, Colombia

Dr K.A. Okada [2]
Coordinator

Dr L. Lopez
Associate Coordinator

Ms Maria de Jesus Orozco Gonzalez
Secretary

North Africa, Southwest Asia and Europe
(Based at Headquarters)

Dr Y.J. Adham
Coordinator

[1] left during the year
[2] joined during the year
[3] Acting Director from April-November 1989
* On extended duty travel from April to November 1989

Communications and Library Services

Mr P. Stapleton
Publications

Ms R.D. Raymond
Public Affairs

Ms J.A. Dearing [2]
Librarian

Ms P. Blake
Secretary

Ms M. Fabri
Clerk

Liaison Office

Mr D. Witmeyer
Liaison Officer
c/o IFPRI, Washington DC, USA

Dr R. Rao [2]
Genetic Diversity

Ms R. Nash [1]
Secretary

Ms J. Brown-Moriani [2]
Secretary

Dr T. Hodgkin [2]
Molecular Biology

Taxonomy Position vacant

Dr R. Mithen [1]
Research Associate
c/o Department of Biological Science, University of Zimbabwe, Harare, Zimbabwe

Research Associate (outposted)
Position vacant

USAID/IBPGR Project Manager
Dr W.S. Null [2]
Central Research Institute for Horticulture, Jakarta, Indonesia

---

South and Southeast Asia
c/o NBPGR, New Delhi, India

Dr J.M.M. Engels
Coordinator

Dr R.K. Arora [2]
Associate Coordinator for South Asia

Mr A.R. Madas
Administrator

Mr B.R. Sharma
Driver

Southeast Asia
c/o IPB, Los Baños, Philippines

Dr L.M. Engle [2]
Associate Coordinator for Southeast Asia

East Asia
c/o CAAS
Beijing, China

Ms Zhou Ming-De
Coordinator

Mr Cui Yun-Xing [1]
Assistant Coordinator

Mr Zhang Zongwen [2]
Assistant Coordinator

Ms Sun Wei
Secretary

Mr Xu Chongping
Driver

Plant Collectors

Mr L. Guarino
(ARI, Cyprus)

Mr A. Bari
(ARI, Cyprus)

Ms H. Moss
(Harare, Zimbabwe)

ECP/GR and interim Coordinator of Crop Networks

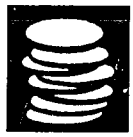
Dipl Ing P.M. Perret

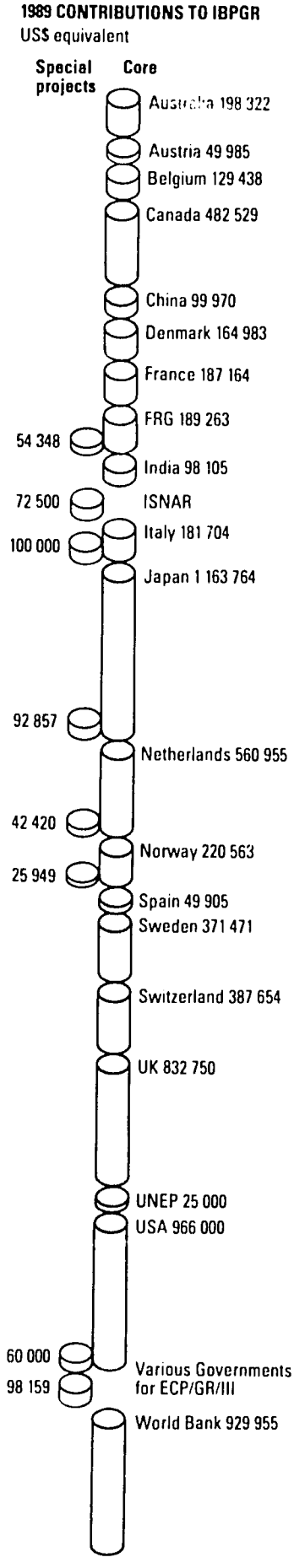
Ms R. Andarias de Prado
Secretary

Seed Handling Units

Ms J. Clark
Royal Botanic Gardens, Kew, UK

Ms R. Chng
National University of Singapore
Singapore





1989 CONTRIBUTIONS TO IBPGR

US$ equivalent

Donor	Core Budget	Special projects
Australia	198 322	
Austria	49 985	
Belgium	129 438[8]	
Canada	482 529	
China	99 970[7]	
Denmark	164 983	
France	187 164[8]	
FRG	189 263	54 348[1]
India	98 105[7]	
ISNAR		72 500[2]
Italy	181 704	100 000[3]
Japan	1 163 764	92 857[4]
Netherlands	560 955	42 420[5]
Norway	220 563	25 949[5]
Spain	49 905	
Sweden	371 471	
Switzerland	387 654	
UK	832 750	
UNEP	25 000	
USA	966 000[9]	60 000[6]
World Bank	929 955	
Various Governments for ECP/GR/III		98 159
	7 289 480	546 233

[1] Support to genebank in CATIE
[2] European Information Service
[3] Screenhouse at Istituto Agronomico Mediterraneo Visiting Scientist at Potenza University and ECP/GR Phase III
[4] Collecting in Pakistan
[5] Pan African Workshop (1988 contribution received in 1989)
[6] *Citrus* and *Mango* conservation in Sumatra
[7] Includes 1988 contribution received in 1989
[8] 1988 contribution received in 1989
[9] Includes part of 1988 contribution received in 1989

CONTRIBUTIONS TO ECP/GR/III IN 1989

US$ equivalents

Belgium	5 922
Bulgaria	5 922
Cyprus	1 481
Czechoslovakia	2 961
Greece	2 961
Ireland	2 961
Israel	2 961
Netherlands	11 844
Norway	5 922
Spain	5 882
Sweden	5 922
Switzerland	5 922
UK	28 615
Yugoslavia	8 883

STATEMENT OF ACCOUNTS FOR 1989

US$ equivalents

RECEIPTS

Balance at 1 January 1989[1]		1 197 773
Various Governments' contributions		7 289 480
Special projects		546 233
Interest accrued in 1989		119 555
		9 153 041

DEDUCT

Cash expenditure		
Core programme		
Personnel services	1 970 926	
Duty travel	739 779	
Contractual services	1 747 810	
General operat. exp.	822 293	
Supplies and materials	58 797	
Equipment	113 007	
Fellowships	236 995	
	5 689 567	
Special projects[2]	371 014	
Payment of obligations carried forward from previous years	1 144 496	
	7 205 077	
Commitments		
Incurred in 1989[3]	1 342 662	
Unliquidated obligations from previous years	480 901	
	9 028 640	9 028 640
BALANCE AT 31 DECEMBER 1989		**124 401**

[1] Unobligated cash balance and unliquidated obligations from previous years

[2] European Cooperative Programme/Phase III, support to genebank in CATIE (FRG), collecting in Pakistan (Japan), *Mango* and *Citrus* project in Sumatra (USA), European Information Service (ISNAR), Visiting Scientist Scheme and Screenhouse (Italy)

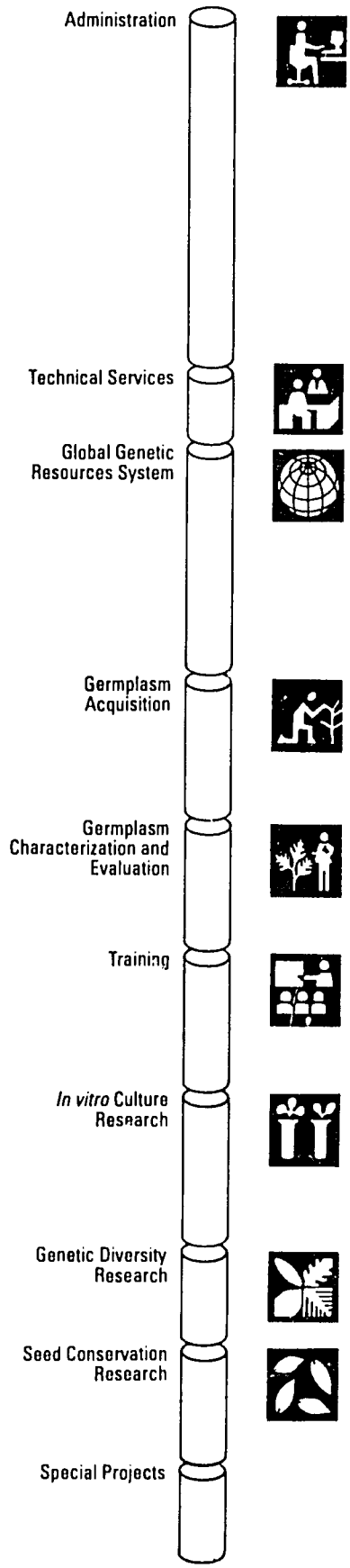
[3] Including commitments for special projects (US$ 43 543) in 1989

1989 EXPENDITURE BY FUNCTIONS

US$ equivalents

Administration	1 866 439
Technical Services	315 030
Global Genetic Resources System	1 150 616
Germplasm Acquisition	688 329
Germplasm Characterization and Evaluation	605 105
Training	659 871
In vitro Culture Research	737 172
Genetic Diversity Research	426 215
Seed Conservation Research	539 909
Special Projects	414 557

1989 EXPENDITURE BY FUNCTIONS



Evénements marquants

L'IBPGR a célébré son quinzième anniversaire dans les nouveaux bâtiments du siège à Rome. L'année a été marquée par d'autres événements importants, notamment, par la décision prise par le Conseil de faire de l'IBPGR un Centre CGIAR pleinement autonome et par diverses mesures adoptées pour concrétiser ce statut. L'élaboration d'un projet de protocole d'entente a préparé le terrain de façon à ce que des relations scientifiques plus solides puissent être nouées avec la FAO après cette séparation. En juin 1989, le Président du CGIAR a formé un comité chargé d'aider aux négociations qui auront lieu entre l'IBPGR et la FAO concernant les plans dressés par le Centre pour préparer son autonomie et sa future organisation administrative. Ce comité, connu sous le nom de Comité Brady, jouera un rôle important dans la détermination des futurs arrangements administratifs pour l'IBPGR.

Après plus de dix années passées à la tête de l'IBPGR, M J.T. Williams a annoncé, en octobre 1989, son intention de démissionner de son poste de Directeur le 28 février 1990. Sa nouvelle nomination fera de lui le Directeur du Programme conjoint Fonds International de la Recherche Agricole/IBPGR pour les cultures arboricoles tropicales pendant deux ans à compter du 1er mars 1990.

La deuxième réunion du Groupe de travail inter-centres sur les ressources phytogénétiques a identifié un certain nombre de domaines de collaboration entre les centres CGIAR. Un certain nombre d'actions ont déjà été concrétisées, comme par exemple la publication par l'IBPGR de "Partners in Conservation".

En 1989, ont eu lieu les premiers préparatifs concernant le nouveau plan stratégique à long terme de l'IBPGR. Un petit Groupe de stratégie a été constitué et un calendrier a été établi à cet effet et entériné par le Conseil. Au début de 1990, un examen interne offrira l'occasion de rassembler des données auprès du personnel du siège et des services extérieurs.

Administration

M W.E. Tossell succède à M W.J. Peacock au poste de Président du Conseil d'administration. Deux nouveaux membres ont rejoint le Conseil, M R. Sevilla-Panizo (Pérou) et M L. Monti (Italie); ils remplacent M W.J. Peacock et M A. Papasolomontos, qui ont démissionné en février. Le Conseil a élu M V.L. Chopra, Vice-Président du Conseil et M D.R. Marshall, Président du Comité du programme. Un Comité présidé par M Marshall, a été constitué pour étudier la question de l'emplacement du siège de l'IBPGR, quand il sera autonome, et un Comité présidé par M C.F. Murphy a commencé à chercher des candidats pour le poste de Directeur. Le poste de Chef de l'administration et contrôleur financier en chef a été pourvu en juin, ce qui donne au Centre un effectif complet en ce qui concerne les chefs de programmes.

Communications et bibliothèque

Un bibliothécaire a été nommé en octobre; les projets de l'IBPGR sont de rassembler une importante collection d'ouvrages sur les ressources phytogénétiques répondant aux besoins des chercheurs extérieurs et du personnel du Centre.

La stratégie de l'IBPGR en matière de publications, telle qu'elle a été définie lors de la Revue interne de 1988, a été approuvée par le Conseil d'administration à sa seizième réunion en février. Elle prévoit, entre autres, d'augmenter le nombre des publications multilingues et la possibilité de réaliser des publications conjointes.

En 1989, le service des affaires publiques s'est plus particulièrement adressé aux groupes d'audience les plus aptes à apporter à l'IBPGR un soutien dans son travail, à savoir ceux qui sont chargés de donner forme aux politiques gouvernementales et ceux qui exercent une influence sur l'opinion publique. Le premier numéro de 'Geneflow', magazine traitant des ressources phytogénétiques et destiné aux Institutions intéressées à la Conservation et autres NGOs, a paru en juin. Le fascicule "Partners in Conservation", qui décrit les activités du CGIAR en matière de ressources genetiques, a été publié à la demande du Groupe de travail inter-centres. Une campagne de sensibilisation du public sera lancée en 1990 en Amérique latine avec des fonds fournis par le gouvernement italien et sera conduite par le CIP, le CIAT, le CIMMYT, l'IBPGR, Inter-Press Service et le magazine Diversity, sous les auspices de la Public Awareness Association for International Agricultural Research. L'IBPGR a prêté son concours au bureau de INTAGRES (International Agricultural Research, European Service) établi à Rome et faisant également partie de l'Association.

Programme de terrain

Le réseau des Bureaux régionaux de l'IBPGR a été complété en 1989 avec la création d'un bureau pour l'Asie du Sud-Est à los Baños (Philippines). Les cérémonies officielles d'ouverture des Bureaux de New Delhi (pour l'Asie du Sud et du Sud-Est) et de Beijing (pour l'Asie de l'Est), opérationnels depuis 1988, ont eu lieu en juin 1989.

En 1989, le programme de terrain a été ultérieurement renforcé grâce au recrutement d'un Assistant Coordonnateur pour l'Amérique du Nord et du Centre et les Caraïbes, d'un Coordonnateur pour l'Amérique du Sud, d'un Coordonnateur associé pour l'Asie du Sud-Est et d'un nouvel Assistant Coordonnateur pour l'Asie de l'Est. L'IBPGR a aussi maintenant trois unités de manutention des semences et trois responsables de la collecte de plantes à temps plein. En 1989, l'Unité de manutention des semences de Singapour a été officiellement ouverte auprès de l'Université nationale, et des négociations ont été menées à bien avec le CATIE (Costa Rica) en vue de la création de la troisième unité. L'Unité de Kew (Royaume-Uni) fonctionne depuis quelques années déjà.

Documentation et caractérisation

Un examen du programme de documentation et de caractérisation de l'IBPGR a été fait en 1989 et un certain nombre de recommandations concernant les activités futures du programme ont été formulées. Il a mis en évidence l'importance des bases centrales de données sur les plantes cultivées pour les travaux menés dans le monde et il a été recommandé que ces bases de données soient ultérieurement développées dans le cadre de programmes coopératifs ou de Réseaux sur les plantes cultivées. De plus, l'IBPGR devrait maintenir un volume suffisant d'information relative aux projets en cours auprès d'autres organisations. L'IBPGR a publié en 1989 un certain nombre de listes de descripteurs et a facilité l'achat de matériel informatique pour huit programmes nationaux. La révision des Répertoires pour les Céréales et pour les Cultures légumières s'est poursuivie et neuf nouveaux projets de caractérisation ont été lancés. Priorité a été donnée aux travaux de caractérisation des ressources phytogénétiques récemment acquises ainsi qu'aux collections concernées par les Réseaux.

La collecte de souches génétiques

L'IBPGR a parrainé ou soutenu des missions de collecte dans 28 pays; nombre de ces missions ont été réalisées par les programmes nationaux. Une prospection la première mission botanique de cette envergure depuis 23 ans – a été réalisée avec l'appui de l'IBPGR dans l'Ile de Socotra, et a apporté 550 specimens d'herbier, notamment pour plusieurs espèces nouvelles à la Science, et des échantillons de graines pour une quarantaine d'espèces sauvages.

Formation

La mise en oeuvre des recommandations découlant de l'examen des activités de formation de l'IBPGR réalise en 1988 a commencé, une attention spéciale étant accordée aux banques de gènes nationales.

L'IBPGR a appuyé la formation de près de 100 chercheurs et techniciens au moyen de bourses post-universitaires, de stages techniques spécialisés de courte durée et de programmes individuels. En décembre, onze étudiants de maîtrises (MSc) ont participé à un stage de recyclage organisé à l'Université de Birmingham (Royaume-Uni) et au siège de l'IBPGR à Rome à l'occasion du vingtième anniversaire du cours international MSc de Birmingham sur les ressources phytogénétiques et du quinzième anniversaire de l'IBPGR.

Réseaux sur les plantes cultivées

Les travaux entrepris dans le cadre du projet pilote sur les plantes cultivées (orge, maïs, *Arachis*, patate douce, *Musa*, okra, *Medicago* et *Beta*) se sont intensifiés. Le concept lui-même a toutefois reçu un accueil général si favorable que l'on a commencé à travailler sur des réseaux consacrés à d'autres cultures, comme le riz, le carthame, le sésame et le soja.

Programme de Recherche

En 1989, le Programme de Recherche a été ultérieurement intégré avec le Programme général de l'IBPGR, une approche régionale ayant été adoptée pour toutes les activités du Centre.

Le programme a été renforcé moyennant le recrutement de deux chercheurs chargés de coordonner la recherche sur la diversité génétique. Ils seront rejoints au début 1990 par un troisième chercheur et par un chercheur associé qui sera en poste à Mexico.

En 1989, quatre chercheurs ont reçu des subventions dans le cadre du Programme de chercheurs visiteurs. Ce schéma permet des visites de chercheurs qualifiés à des instituts de recherche afin de collaborer aux projets parrainés par l'IBPGR.

Recherche sur la conservation des semences

L'IBPGR a parrainé des projets sur la conservation de semences en milieu ultra-sec qui ont donné des résultats prometteurs. Les effets de l'humidité et de la température sur la longévité des semences, les techniques de conversation de semences récalcitrantes, la stabilité génétique en cours d'entreposage et de régénération ainsi que les problèmes de dormance des semences ont été étudiés dans le cadre d'autres projets.

Recherche *in vitro*

En 1989, l'IBPGR a continué de mettre au point des techniques de collecte et de conservation *in vitro* et d'étudier la stabilité de plantes cultivées conservées *in vitro*. La banque de gènes active *in vitro*, projet pilote conjoint IBPGR/CIAT, a expérimenté pendant trois ans des modèles de normes de fonctionnement. Les deux centres collaborent pour maximiser l'impact de cette étude pour la conservation *in vitro* à moyen terme.

Le projet IBPGR de bases de données sur la conservation *in vitro*, qui a commencé en 1980 à l'Université de Nottingham, a officiellement pris fin en 1989. Une enquête a été menée vers la fin de l'année auprès des usagers pour savoir comment répondre le mieux possible aux besoins actuels d'information.

Pathologie végétale et quarantaine

Des directives techniques sur la circulation sans risque du matériel génétique, ont été mises au point pour *Musa*, le cacao, la patate douce, l'igname et les aracées comestibles, et ont été publiées conjointement par la FAO et l'IBPGR. Des réunions ont eu lieu pour mettre au point des directives similaires pour les légumineuses et les agrumes. Un projet de recherche a permis la mise au point d'une sonde diagnostique pour la détection du virus du bunchy top de la banane. Dans d'autres projets, les recherches ont été poursuivies en vue de la mise au point de méthodes d'indexage rapide de virus, de tests antiviraux à large spectre d'activité ainsi que des tests non destructifs de contrôle sanitaire des semences.

Recherche sur la diversité génétique

Au début de 1990, un examen du Programme de Recherche sur la diversité génétique sera effectué en vue d'établir l'orientation du Programme pour les cinq prochaines années. A cette fin, tous les rapports de projets antérieurs ayant trait à un aspect de diversité génétique et appuyés par l'IBPGR, seront examinés.

Un certain nombre de projets portant sur divers aspects de la diversité génétique, financés partiellement ou complètement par l'IBPGR, se sont poursuivis en 1989. De nouveaux travaux ont été lancés pour étudier la diversité génétique des *Vigna* et pour effectuer une enquête écogéographique des parents sauvages des *Citrus* et de la mangue en Indonésie. D'autres projets ont permis de faire le point des informations disponibles en matière de systèmes de reproduction et d'examiner les bases scientifiques de la régénération.

L'IBPGR considère les collections représentatives de la diversité génétique d'une espèce cultivée et de ses parents sauvages comme un instrument de recherche approprié à l'étude de cette diversité. Afin de faciliter la coopération internationale pour le développement de telles collections représentatives, l'IBPGR a en 1989 dressé à l'échelle mondiale l'inventaire des chercheurs impliqués dans ce développement.

ECP/GR

A sa quatrième réunion en 1989, le Comité consultatif technique a recommandé la réalisation d'une phase IV du programme ECP/GR. A partir de 1990-92, la Phase IV concentrera ses efforts pour renforcer ce type d'activités au sein du système des Réseaux sur les plantes cultivées. L'IBPGR a été invité à exécuter cette phase IV de l'ECP/GR, rebaptisé Programme coopératif européen des Réseaux sur les ressources génétiques des plantes cultivées, titre qui traduit de plus près l'orientation du programme.

Acontecimientos 1989

El IBPGR celebró su 15o aniversario en su nueva Sede de Roma. Otros acontecimientos importantes fueron la decisión tomada por la Junta de que el IBPGR debe convertirse en un Centro CGIAR completamente independiente y los pasos dados para lograrlo. El borrador del Memorando de Acuerdo sentó las bases para una relación científica más estrecha con la FAO, después de la separación. En junio de 1989, el Presidente del CGIAR designó a un comité de apoyo al proceso de negociaciones entre el IBPGR y la FAO respecto a los planes del Centro para lograr plena autonomía y a sus futuras medidas administrativas.

El Director Ejecutivo del IBPGR, Profesor J.T. Williams, después de una década de servicio, anunció en octubre de 1989, su intención de presentar su dimisión a partir del 28 de febrero de 1990. Tomará posesión de un nuevo cargo como Director del Programa Conjunto del Fondo Internacional de Investigación Agrícola/Cultivos de Arboles Tropicales del IBPGR, durante un período de dos años a partir del 1 de marzo de 1990.

La segunda reunión del Grupo de Trabajo entre Centros sobre Recursos Fitogenéticos identificó varias áreas de colaboración entre los Centros CGIAR.

Durante 1989 se dieron los primeros pasos en la preparación del nuevo Plan Estratégico a largo plazo del IBPGR. Se estableció un pequeño Grupo Estratégico y un calendario para preparar el Plan adoptado por la Junta. A principios de 1990 un examen interno ofrecerá información procedente del personal de la Sede y del campo.

Administración

El Doctor W.E. Tossell sucedió al Doctor W.J. Peacock como Presidente de la Junta de Administración. Se incorporaron a la Junta dos nuevos miembros, el Ing. R. Sevilla-Panizo (Perú) y el Profesor L. Monti (Italia), quienes reemplazaron al Dr. W.J. Peacock y al Dr. A. Papasolomontos, quienes renunciaron en febrero.

La Junta eligió al Profesor V.L. Chopra como Vice-Presidente y al Profesor D.R. Marshall como Presidente del Comité de Programas. Se encargó a un Comité de Localización, presidido por el Profesor Marshall, la búsqueda de una ubicación para la sede de un IBPGR independiente y a un Comité de Personal, presidido por el Dr. C.F. Murphy, las gestiones para la selección de candidatos adecuados para el cargo de Director. El puesto de Jefe de Administración y Jefe de Finanzas se cubrieron en junio, dando así al Centro una dotación completa de Jefes de Programa.

Servicio de Biblioteca y Comunicaciones

Se contrató a un bibliotecario en octubre, con un programa para elaborar una colección guía de publicaciones sobre recursos fitogenéticos para satisfacer las necesidades de investigadores externos y del personal profesional del Centro.

La estrategia de publicaciones del IBPGR fue aprobada en febrero por la Junta de Administración en su 16ª reunión. Entre otras cosas, esta estrategia requiere más publicaciones multilingües y el estudio de proyectos conjuntos de publicaciones.

En 1989, la Oficina de Relaciones Públicas se centró en los grupos de audiencia más susceptibles de apoyar las actividades del IBPGR: aquéllos que deciden las líneas políticas y que influencian la opinión pública. El primer número de "Geneflow", revista que trata sobre recursos fitogenéticos, se publicó en junio. En 1990 se lanzará una campaña de concientización de la opinión pública en América Latina, financiada por el Gobierno Italiano que será llevada a cabo por el CIP, CIAT, CIMMYT, IBPGR, Inter Press Service y Diversity Magazine, bajo los auspicios de la Asociación de Sensibilización del Público sobre la Investigación Agrícola Internacional.

Programa de Campo

La red de oficinas regionales del IBPGR se completó en 1989 con el establecimiento de una oficina para el sudeste asiático en Los Baños, Filipinas. La inauguración oficial de las oficinas de Nueva Delhi (para el sur y el sudeste asiático) y Beijing (para Asia oriental) tuvo lugar en junio de 1989, a pesar de que ya funcionaban desde 1988.

En 1989, el Programa de Campo se reforzó con un coordinador adjunto para América del Norte, América Central y el Caribe, un coordinador para América del Sur, un coordinador asociado para el sudeste asiático y un nuevo coordinador adjunto para Asia oriental. El IBPGR también cuenta actualmente con tres Unidades de Manejo de Semillas (UMS) y tres recolectores de semillas de dedicación completa. En 1989, la UMS de Singapur se estableció oficialmente en la Universidad Nacional y se ultimaron las negociaciones con CATIE, Costa Rica, para el establecimiento de la tercera Unidad. La Unidad de Kew, Reino Unido, funciona desde hace algunos años.

Documentación y Caracterización

El Programa de Documentación y Caracterización del IBPGR se examinó en 1989. Este examen puso de relieve la importancia que tienen las bases de datos sobre cultivos centrales para los esfuerzos mundiales y recomendó su ulterior desarrollo en programas de cooperación y/o en redes de cultivos. El IBPGR publicó en 1989 varias listas de descriptores y apoyó a 8 Programas Nacionales en la adquisición de ordenadoras. Se empezaron nueve proyectos nuevos de caracterización.

Adquisición de germoplasma

El IBPGR patrocinó o apoyó misiones de recolección en 28 países, muchas de las cuales fueron llevadas a cabo por Programas Nacionales.

Capacitación

La puesta en práctica de las recomendaciones del Programa de Capacitación del IBPGR en 1988 se inició dando especial atención a los bancos genéticos nacionales.

El IBPGR apoyó la capacitación de alrededor de 100 científicos y técnicos que tenían becas de postgrado, así como breves cursos técnicos especializados y programas individuales. En diciembre, 11 alumnos de cursos de licenciatura participaron en un curso de perfeccionamiento, impartido en la Universidad de Birmingham, Reino Unido, y en la Sede del IBPGR en Roma, organizado para conmemorar el 20º aniversario del Curso Internacional de Licenciatura de Birmingham sobre Recursos Fitogenéticos y el 15º aniversario del IBPGR.

Redes de cultivos

El trabajo se intensificó en los cultivos del proyecto piloto (cebada, maíz, *Arachis*, batata, *Musa*, ocra, *Medicago* y *Beta*). Sin embargo, el concepto en sí mismo recibió tal aceptación general que el trabajo ha comenzado en las redes con otros varios cultivos, por ejemplo, arroz, cártamo, sésamo y soja.

Programa de investigación

En 1989 se adoptó un enfoque regional de todas las actividades del Centro, integrando el Programa de Investigación con el Programa global del IBPGR.

El Programa se reforzó con la contratación de dos nuevos miembros para coordinar la investigación sobre diversidad genética. A este equipo se unirá una tercera persona a principios de 1990 y un investigador asociado que tendrá base en México.

Los primeros 4 científicos recibieron becas del Programa de Científicos Visitantes. Este Programa permite seleccionar a científicos para que visiten instituciones de investigación que colaboren con proyectos de investigación patrocinados por el IBPGR.

Investigación sobre Conservación de semillas

Los proyectos de almacenamiento de semillas ultrasecas, patrocinados por el IBPGR, dieron resultados alentadores. Otros proyectos estudiaron la repercusión de la humedad y temperatura en la longevidad de las semillas, las técnicas de conservación de semillas recalcitrantes, la estabilidad genética durante el almacenamiento y la regeneración y los problemas de latencia de semillas.

Investigación *in vitro*

En 1989 el IBPGR continuó desarrollando técnicas de recolección y almacenamiento *in vitro* e investigación sobre la estabilidad de los cultivos almacenados *in vitro*. El Banco Activo de Genes *in vitro*, de carácter piloto, del IBPGR-CIAT, culminó sus tres años de pruebas con modelos estándares de operación. Los dos Centros colaborarán para maximizar el impacto del estudio.

El proyecto Base de Datos sobre Conservación *in Vitro* del IBPGR, que empezó en la Universidad de Nottingham en 1980, finalizó oficialmente en 1989. A fines del año se llevó a cabo una encuesta entre los usuarios con el objetivo de determinar el mejor método para satisfacer las necesidades actuales de información.

Fitopatología y cuarentena

Las Directrices Técnicas para el Transporte Seguro de Germoplasma, publicación conjunta de la FAO y el IBPGR, se formularon para la *Musa*, el cacao, la batata, el ñame y las aroideas comestibles. Se celebraron reuniones para desarrollar ulteriores directrices para las leguminosas y los cítricos. Otros proyectos incluían el desarrollo de un diagnóstico de prueba para el virus principal de los racimos de banana, métodos rápidos para clasificar virus y métodos no destructivos para analizar la salud de las semillas.

Investigación sobre la diversidad genética

A principios de 1990, se analizará el Programa de Investigación sobre Diversidad Genética a fin de determinar su orientación durante los próximos cinco años.

En 1989 se prosiguieron varios proyectos sobre los aspectos de diversidad genética. Entre las nuevas iniciativas se encuentra una investigación sobre diversidad genética en *Vigna* y un estudio ecogeográfico de las especies silvestres de los cítricos y del mango en Indonesia. Otros proyectos examinaron la información actual sobre sistemas de cultivos y analizaron las bases científicas para la regeneración.

ECP/GR

En su 4ª reunión de 1989, el Comité Técnico Consultivo recomendó una IV Fase del ECP/GR desde 1990-92 para reforzar sus actividades en el marco del sistema de red de cultivos. Se ha solicitado al IBPGR que ejecute la IV Fase del ECP/GR, rebautizado Programa Europeo de Cooperación de Redes de Cultivos de Recursos Fitogenéticos para que refleje minuciosamente el objetivo del Programa.

Höhepunkte des Jahres 1989

Das IBPGR feierte seinen 15. Jahrestag im neün Gebäude seiner Zentrale in Rom. Ein weiteres wichtiges Ereignis war die Entscheidung des Rates, das IBPGR zu einem völlig unabhängigen CGIAR-Institut zu machen, und diesen Status schrittweise zu verwirklichen. Die Abfassung eines Memorandums zur Verständigung legte den Grundstein für eine engere wissenschaftliche Zusammenarbeit nach der Trennung.

Nach mehr als zehnjähriger Tätigkeit als Leiter des IBPGR kündigte Professor J.T. Williams in Oktober 1989 seinen Rücktritt von diesem Amt für dan 28. Februar 1990 an. Er wird vom 1. März 1990 an für zwei Jahre das Amt des Direktors des gemeinsamen Internationalen Fonds für Agrar-Forschung/IBPGR-Programm für tropische Waldkultur antreten.

Beim zweiten Treffen der Arbeitsgruppe für Pflanzengenetische Ressourcen wurde eine Reihe von gemeinsamen Arbeitsgebieten für die CGIAR-Institute erarbeitet.

Im Laufe des Jahres 1989 wurden erste Vorbereitungen getroffen für einen langfristigen Strategieplan des IBPGR. Man bildete eine kleine Strategie-Gruppe und stellte einen Zeitplan auf, um diesen vom Rat angenommenen Plan vorzubereiten. Anfang 1990 wird ein interner Bericht die Möglichkeiten der Zuarbeit sowohl von Seiten der Zentrale als auch von Seiten des Aussenpersonals erläutern.

Verwaltung

Dr W.E. Tossell löste Dr W.J. Peacock als Vorsitzenden des Treuhänderrates ab. Zwei neue Kollegiums-Mitglieder, Ing R. Sevilla-Panizio (Peru) und Professor L. Monti (Italien) ersetzten Dr W.J. Peacock sowie Dr A. Papasolomontos, der im Februar zurückgetreten war. Der Rat wählte Professor V.L. Chopra zum stellvertretenden Vorsitzenden und Professor D.R. Marshall zum Vorsitzenden des Programm-Komittees. Ein Standort-Komittee, geleitet von Professor Marshall, wirde eingerichtet, um die Unterbringung der Zentrale des unabhängigen IBPGR zu untersuchen, und ein Prüfungsausschuss, geleitet von Dr C.F. Murphy, begann mit der Suche nack geeigneten Kandidaten für das Amt des Direktors. Das Armt des Verwaltungschefs und des Leiters der Finanzkontrolle wurde im Juni besetzt. Die Organisation hat dadurch eine komplette Programm-Spitze.

Kommunikation und Bibliothek

Im Oktober wurde ein Bibliothekar ernannt mit der Aufgabe, eine Sammlung der führenden Literatur zum Thema pflanzengenetische Ressourcen zu erstellen, um den Anforderungen der externen Forscher und der Fachleute in der Zentrale gerecht zu werden.

Die Veröffentlichungs-Taktik des IBPGR wurde vom Rat während seines 16. Treffens im Februar gebilligt. Unter anderem sind eine grössere Zahl mehrsprachiger und gemeinschaftlicher Veröffentlichungen nötig.

1989 konzentrierte sich das Büro für Öffentlichkeitsarbeit auf Zielgruppen, die am ehesten in der Lage sind, Unterstützung für die Arbeit des IBPGR zu initiieren: nämlich auf all jene, die öffentliche Politik machen sowie die öffentliche Meinung beeinflussen. Die erste Ausgabe von 'Geneflow', eines Magazins über pflanzengenetische Ressourcen, wurde im Juni veröffentlicht. 1990 werden CIP, CIAT, CIMMYT, IBPGR, Inter Press Service und dem Diversity Magazin unter der Schirmherrschaft der Vereinigung für Öffentlichkeitsarbeit für Internationale Agrarforschung eine Kampagne für Öffentlichkeitsarbeit in Lateinamerika durchführen, die von der italienischen Regierung finanziert wird.

Entwicklungs-programme

Das Netz der IBPGR-Regionalbüros wurde 1989 durch die Einrichtung eines Büros im südost-asiatischen Los Baños auf den Philippinen ergänzt. Wenngleich sie bereits seit 1988 einsatzfähig waren, fanden die offiziellen Eröffnungsfeierlichkeiten für die Büros in Neu-Delhi (für Süd- und Südost-Asien) und in Beijing (für Ost-Asien) im Juni 1989 statt.

1989 wurden die Entwicklungsprogramme durch einen stellvertretenden Koordinator für Nord- und Zentral-Amerika und die Karibik, einen Koordinator für Südamerika, einen ausserordentlichen Koordinator für Südamerika, einen ausserordentlichen Koordinator für Südost-Asien und einen neuen stellvertretenden Koordinator für Ost-Asien weiter verstärkt. Das IBPGR hat jetzt ausserdem drei Saat-Bearbeitungs-Anlagen (SHU) und drei hauptamtliche Pflanzen-Sammler. 1989 wurde die Saat-Bearbeitungs-Anlage in Singapur offiziell in der National University eingerichtet. Weiter wurden Verhandlungen mit CATIE, Costa Rica, über die Einrichtung einer dritten Anlage abgeschlossen. Die Anlage in Kew, Grossbritannien, ist seit einigen Jahren einsatzfähig.

Dokumentation und Kennzeichnung

Das IBPGR-Programm Dokumentation und Kennzeichnung wurde neu überdacht. Dabei wurde die Bedeutung von zentralen Ernte-Datenbanken hervorgehoben sowie deren Weiterentwicklung zu Gemeinschaftsprogrammen und/oder Forschungsringen für Feldfrüchte empfohlen. IBPGR veröffentlichte 1989 eine Reihe von Arten-Verzeichnissen und unterstützte acht stafftliche Programme zum Ankauf von Computer-Ausrüstung.

IBPGR finanzierte oder unterstützte Sammel-Aktionen in 28 Ländern, von denen viele im Rahmen nationaler Programme verwirklicht wurden.

Beschaffung von Keimplasma

Um die Empfehlungen des IBPGR-Ausbildungsberichts von 1988 umzusetzen, wurde begonnen, den nationalen Genbanken besondere Aufmerksamkeit zu schenken.

Das IBPGR förderte die Ausbildung von fast 100 Wissenschaftlern und Technikern in Form von Graduierten-Stipen-dien, technischen Spezialisierungs-Kursen und individüllen Programmen. Im Dezember nahmen elf Wissenschaftler an einem Auffrischungs-Lehrgang teil, der an der Universität von Birmingham, Grossbritannien, und in der Zentrale in Rom veranstaltet wurde. Damit wurde gleichzeitig der 20. Jahrestag des Internationalen Wissenschaftlichen Lehrgangs zum Thema pflanzengenetische Ressourcen in Birmingham sowie der 15. Jahrestag des IBPGR gefeiert.

Ausbildung

Forschungsringe für Feldfrüchte

Die Arbeit verstärkte sich bei den Erzeugnissen der Pilot-projekte (Gerste, Mais, *Arachis*, Süsskartoffel, *Musa*, Eibisch, *Medicago* und *Beta*). Das Konzept selbst jedenfalls wurde allgemein anerkannt und man begann bereits mit Netzwerken für weitere Produkte, zum Beispiel für Reis, Saflor, Sesam und Sojabohnen.

Forschungs-Programm

1989 wurde das Forschungs-Programm weiter in das IBPGR-Gesamtprogramm integriert. Regionale Ansätze bei allen Aktivitäten der Zentrale wurden angenommen.

Das Programm wurde durch zwei Koordinatoren zur Erforschung der genetischen Vielfalt verstärkt. Ihnen wird sich Anfang 1990 ein dritter Mitarbeiter anschliessen, ein Forschungsmitarbeiter wird ausserdem in Mexiko die Arbeit aufnehmen.

Die ersten vier Wissenschaftler erhielten Stipendien im Rahmen des wissenschaftlichen Besuchs-Projekts. Dieses Projekt erlaubt es ausgewählten Wissenschaftlern, Forschungseinrichtungen zu besuchen und an IBPGRfinanzierten Forschungsprojekten mitzuarbeiten.

Forschung zur Saatgutkonservierung

Die vom IBPGR finanzierten Projekte zur Ultratrockenlagerung von Saatgut erbrachten vielversprechende Ergebnisse. Andere Projekte untersuchten die Auswirkungen von Feuchtigkeit und Temperatur auf die Langlebigkeit von Saatgut, die Konservierung von anfälligem Saatgut, die genetische Beständigkeit während Lagerung und Neubildung sowie Probleme des Ruhezustands von Saatgut.

***Invitro*-Forschung**

1989 Setzte das IBPGR die Entwicklung von *Invitro*-Sammlungen und der Lagerungstechnik fort und untersuchte die Beständigkeit von gelagerten *Invitro*-Kulturen. Die Versuchs-Genbank für aktive *Invitro*-Kulturen des IBPGR-CIAT vervollständigte seinen dreijährigen Test für Musternormen der Verfahrenweise. Die beiden Zentren kooperieren, um diese Forschungsergebnisse zu maximieren.

Das IBPGR-Projekt für eine Datenbank zur *Invitro*-Konservierung, das 1980 an der Universität von Nottingham gestartet wurde, ging 1989 offiziell zu Ende. Im Laufe des Jahres wurde ein Benutzergutachten erstellt, um den laufenden Informationsbedürfnissen optimal begegnen zu können.

Pflanzen-Pathologie und Quarantäne

Techinische Richtlinien zur sicheren Entwicklung von Keimplasma, gemeinsam veröffentlicht von FAO und IBPGR, wurde für *Musa*, Kakao, Süsskartoffeln, Jam und Wurzeln (Araceä) erstellt. Es wurden Treffen veranstaltet, um ergänzende Richtlinien für Hülsen- und Zitrusfrüchte zu erarbeiten. Andere Projekte beinhalteten die Entwicklung von Diagnose-Methoden für den Virus der Bananenstaude, von Schnellerf assungs-Methoden für Viren und von unschädlichen Gesundheitstests von Saatgut.

Forschung über die genetische Vielfalt

Anfang 1990 wird das Programm zur Erforschung der genetischen Vielfalt überprüft, um Richtlinien für die nächsten fünf Jahre zu erstellen.

1989 wurde eine Reihe von Projekten zur Erforschung der genetischen Vielfalt fortgesetzt. Neu war eine Forschungsarbeit über die genetische Vielfalt im Weinbau und eine ökogeographische Untersuchung über die wild wachsenden Verwandten von Zitrus- und Mangofrüchten in Indonesien. Andere Projekte sammelten Informationen über Zuchtsysteme und überprüften die wissenschaftlichen Grundlagen zur Fortpflazung.

ECP/GR

Auf seinem vierten Treffen hat der technische Beratungsausschuss für den Zeitraum 1990-92 die vierte Phase für das ECP/GR empfohlen, um die Aktivitäten innerhalb des Systems der Forschungsringe für Feldrüchte zu verstärken. IBPGR wurde aufgefordert, für die Durchführung der vierten Phase im ECP/GR zu sorgen. ECP/GR war umbenannt worden in Europäisches Kooperationsprogramm zur Erforschung genetischer Ressourcen von Feldrüchten, um die Zielsetzung des Programms besser wiederzugeben.

IBPGRは、ローマ市内の新しい本部の建物で創立15周年を迎えた。他の重要な出来事は、IBPGRがFAOと完全に独立したCGIAR（農業研究協議グループ）のセンターとなること、そのための準備を進めることが理事会によって決定されたことである。このため、独立後FAOと科学、技術的関係を強化するためにFAOとの間で覚え書きの草案作りが進められた。1989年6月、CGIAR議長は、IBPGRの独立と将来の運営に関するIBPGRとFAOの交渉を円滑に進めるために特別委員会を設けた。

1989年10月、IBPGR所長 J.T. Williams教授は、1990年2月28日付で所長を辞任する意向を表明した。Williams教授は、1990年3月1日から2年間、農業研究評議員会とIBPGRの熱帯関係共同計画の所長を務めることになった。

植物遺伝資源に関するCGIAR研究センター作業部分の第2回会議が開催され、多くの協力分野が決定された。

1989年に、IBPGRの新しい長期目標を作成する作業が始められた。このための作業部会とスケジュールが理事会によって承認された。1990年前半、IBPGRの内部レビューを行い、本部および外部関係者職員から意見をきくことにしている。

管理

W.E. Tossel博士が、W.J. Peacock博士に代って理事会議長に選ばれた。W.J. Peacock博士と2月に辞任したA. Papasotiropoulos博士に代ってR. Sevilla Panizo博士（ペルー）とL. Monti教授（イタリー）が新たに理事に任命された。理事会は、V.L. Chopra教授を副議長に、D. R. Marshall教授を計画委員会の委員長に選んだ。IBPGR本部の新しい場所の選定を検討する委員会（委員長Marshall教授）、新所長の候補者を公募する委員会（委員長 C.E. Murphy博士）が設けられた。管理部長と会計担当主任も6月に任用された。

情報と図書サービス

植物遺伝資源に関する主要な文献を収集・整理し、IBPGRのスタッフや外部の研究者に対する便宜を図るために1名の図書職員を採用した。

IBPGRの出版計画が2月の理事会で承認された。その中で、特にいろいろの言語による出版をふやすこと、他と共同で出版することの可能性を探ることなどが要望された。

1989年に、広報官は、公の政策を決めたり、世論に影響を及ぼすグループに働きかけて、IBPGRの仕事に対する支持を得ることに務めた。 植物遺伝資源に関する雑誌「GeneFlow」の第1号が6月に刊行された。イタリーからの特別拠出金を用いて、ラテンアメリカにおける啓蒙活動が、国際農業研究公共啓蒙協会の後援のもとに、CIP, CIAT, CIMMYT, IBPGR, INTER PRESS SERVICESおよび雑誌「DIVERISTY」によって1990年に実施されることになった。

フィールド計画

IBPGRの地域事務所のネットワーク化が、フィリピンのロス・バニョスに東南アジア事務所の開設によって1989年に完成した。すでに1988年以来活動を始めていた南および中南アジア地域を担当するニューデリー事務所と東アジア地域を担当する北京の事務所の正式な開所式が1989年6月に行われた。

1989年には、北・中米とカブリ海地域、南米、東南アジアおよび東アジアの地域事務所に調整者を任命しフィールド計画を強化させた。IBPGRはまた、収集した種子の検査・無害化や移動を取り扱うSeed Handling Unitをイギリスのキュー植物園、シンガポール国立大学、コスタリカのCATIEの3カ所に配置した。キュー植物園のものはすでに数年間活動を行ってきた。

記録と特性評価

IBPGRの記録と特性評価に関する計画について、1989年レビューが行われ、とくに重要な作物の世界的データベース作成、ネットワーク化などを促進することが勧告された。IBPGRは、1989年に多数の作物について形質調査基準を作成し、8カ国にコンピューター備品を与えた。

遺伝資源の収集

ＩＢＰＧＲは、２８カ国で実施された植物遺伝資源の探索・収集に参加したり支援を行った。大部分は各国の収集計画によって実施された。

トレーニング

１９８８年に行われたトレーニングに関するレビュー勧告に基づいて、とくに各国のジーンバンクの運営に重点をおいたトレーニングが行われた。

ＩＢＰＧＲは、短期専門コース，個別研修，大学院レベルの特別研究生を含む約１００人の科学者のトレーニングに援助を与えた。１２月に、バーミンガム大学植物遺伝資源修士コースの１１名の卒業生が、大学コース２０周年の記念行事として行われた再教育講習会に参加し、さらにＩＢＰＧＲの１５周年を記念してローマの本部に集まった。

作物のネットワーク

オオムギ，トウモロコシ，サツマイモ，バナナ，オクラ，アルファルファ，ビートを試験的な材料としてネットワークを進めることが集中的に行われた。この計画は、さらにイネ，ベニバナ，ゴマ，タイズなどについても行う方向で合意が得られている。

研究計画

１９８９年に、地域的課題を含めたＩＢＰＧＲ全体計画の中で、研究計画部内の果たす役割の検討が行われた。

遺伝的多様性に関する研究を調整するために２名の職員が任命された。この分野には、１９９０年さらに１名の職員とメキシコに駐在する研究者が参加することになる。

４名の科学者が、客員科学者計画制度に基づいて助成金を受けた。この計画では、選ばれた科学者は、ＩＢＰＧＲがスポンサーになって行う研究計画に協力するためにいろいろの研究機関を訪問することができる。

種子保存研究

ＩＢＰＧＲがスポンサーになって行った超乾燥種子貯蔵プロジェクトは有望な結果を得た。他に、種子の寿命に対する水分と温度の影響，リカルシトラント種子の保存技術，貯蔵中および再増殖中に生ずる遺伝的安定性，種子の休眠の問題が研究された。

試験管内研究

１９８９年に、ＩＢＰＧＲは試験管収集，保存技術，試験管内での培養保存中の安定性に関する研究を継続した。試験管内保存ジーンバンクに関するＩＢＰＧＲとＣＩＡＴの共同研究は３カ年の予備試験を完了したが、この研究の重要性を考えてさらに協力を促進する。

１９８０年ノッティンガム大学で始めたＩＢＰＧＲの試験管内保存データベースプロジェクトは１９８９年に終了した。

植物病理と防疫

植物遺伝資源の安全な移動技術指針が、バナナ，ココア，サツマイモ，ヤムイモおよび食用サトイモについて、ＦＡＯとＩＢＰＧＲの共同で出版された。マメ類およびカンキツ類についてもガイドラインを作成するための会議が開かれた。

他のプロジェクトとして、バナナのバンチートップウイルス病診断プローブ，ウイルス病の迅速病原特定法，非破壊種子健全検定法の研究開発が行われた。

遺伝的多様性に関する研究

１９９０年前半に，遺伝的多様性に関する研究プロジェクトのレビューが行われ、今後５年間のプログラムの方向が決定されることになった。遺伝的多様性に関する多くの研究課題が１９８９年に継続して実施された。新たな課題として、サリケの遺伝的多様性とインドネシアにおけるカンキツ類とマンゴー野生種の生態地理的調査が取り上げられた。また、繁殖体系に関する最近の情報を集めたり、再増殖の科学的基礎について再検討した。

ECP／GR

１９８９年の第４回会議において、技術諮問委員会が、作物ネットワーク活動の強化のためにECP／GR（作物遺伝資源の保存・交換に関するヨーロッパ協力計画）の第４期（１９９０～９２年）の継続を勧告した。ＩＢＰＧＲは、この第４期を実施するように要請された。この計画の目的を正しく反映するために、名前を「作物遺伝資源ネットワークに関するヨーロッパ協力計画」に変更した。

国际植物遗传资源委员会在罗马新的总部大楼庆祝成立十五周年。其它大事有：理事会作出决定，国际植物遗传资源委员会应成为一个完全独立的中心，并采取措施来达到这种地位。例如，草拟一份与粮农组织的谅解备忘录，为在独立后与粮农组织保持更紧密的科技关系奠定基础。1989年6月，国际农业研究磋商小组主席任命了一个委员会，协助在国际植物遗传资源委员会和粮农组织之间就有关实现完全独立的中心的计划及其未来的管理安排进行谈判。

J·T·威廉斯教授在担任十多年国际植物遗传资源委员会执行主任之后，于1989年10月宣布他从1990年2月28日起辞去本委员会主任的职务。他将担任负责国际农业研究基金会/国际植物遗传资源委员会合办的热带树木作物计划的主任，任期从1990年3月1日起为期两年。

植物遗传资源跨中心工作小组第二次会议提出了在国际农业磋商小组各中心之间开展协作的一些领域。

在1989年期间，采取了初步的措施来编制本委员会的新的长期战略计划。设立了一个战略编制小组，理事会批准了编制计划的时间表。在1990年初将进行一次内部审查，从而为总部和外派的人员提供参与意见的机会。

管　理

W·E·托塞尔博士接替W·J·皮科克博士担任理事会主席。两名新的理事加入了理事会：R·塞维利亚一帕尼佐先生（秘鲁）和L·蒙蒂教授（意大利），他们接替在二月份离职的W·J·皮科克博士和A·帕帕所罗门多斯教授。理事会选举V·L·乔波拉教授为理事会副主席，选举D·R·马歇尔教授担任计划委员会主席。成立了由马歇尔教授为主席的会址委员会，负责审议本委员会独立后的总部会址事宜，并成立了一个由C·F·墨菲博士为主席的聘选委员会，开始进行选定担任主任的合适人选的工作。管理和财务处长的职位在六月份已聘定，使本中心各项计划的负责人都已补全。

联络和图书馆服务

10月份任命了一名图书管理员，计划将有关植物遗传资源文献资料的藏书放在至先的地位，以满足外部研究人员和本中心专业人员的需要。

理事会在二月份召开的第十六次会议上批准了本委员会的出版方针。除了其它的内容以外，出版方针规定要发行多语种的出版物，并调查举办联合出版业务的可能性。

1989年公共关系办公室将重点工作对象放在能为本委员会的工作提供最好支持者的身上，即那些制定公共政策和影响公众观点的人。关于植物遗传资源的一份杂志《植物遗传信息》的第一期于六月份出版。由意大利政府资助在拉丁美洲开展的公共宣传运动，将在国际农业研究公共宣传协会的主办下，由国际马铃薯中心、国际热带农业中心、国际玉米小麦改良中心、国际植物遗传资源委员会、国际新闻服务社和“多样性杂志”共同合作下在拉丁美洲开展。

实地计划

随着在菲律宾的洛斯巴诺斯为东南亚设立了一个办事处，本委员会的区域办事处网络在1989年已告完成。设在新德里的办事处（为南亚和东南亚）和设在北京的办事处（为东亚）虽然自1988年以来已开展业务活动，但正式的开幕式是在1989年六月份举行的。

1989年新任命的几名协调官员使实地计划进一步得到加强：北美、中美和加勒比的一名助理协调员，南美的一名协调员，东南亚的一名助理协调员，和东亚的一名助理协调员。本委员会现在还拥有三个种子处理组和三名全职的植物采集员。1989年在新加坡国立大学正式成立了种子处理组，已就建立第三个种子处理组与设在哥斯达黎加的热带农业研究和培训中心进行了谈判。设在英国的丘城的种子处理组已开展活动数年。

资讯工作和性状记录

本委员会的资讯工作和性状记述计划在1989年进行了审查。审查工作强调了进行全球性努力以建立中心作物数据库的重要性，并建议通过各项合作计划和/或作物网络来进一步推行此项工作。本委员会1989年出版了一些作物的描述符，并支持8项国家计划购买电子计算机设备。9项新的性状记述项目已开始执行。

种质采集

国际植物遗传资源委员会主办或支持在28个国家中的种质采集组的工作，其中许多是由国家计划进行的。

培　训

开始实施1988年国际植物遗传资源委员会培训工作审查所提出的建议，特别注意国家的基因库。

国际植物遗传资源委员会支持对将近100名科技人员参加以研究生进修、短期技术培训班和各项培训计划的形式的培训。12月份，11名理科硕士校友参加了在英国伯明翰大学和在罗马国际植物遗传资源委员会总部举办的进修班，以纪念伯明翰大学植物遗传资源理科硕士国际培训班开办二十周年和国际植物遗传资源委员会成立十五周年。

作物网络

在试点项目中加强对8种作物的工作（大麦、花生、玉米、甘薯、芭蕉、秋葵、苜蓿和甜菜）。然而，这种做法本身受到普遍欢迎，因此开始为另外几种作物（如水稻、红花、芝麻和大豆）设立网络。

研究计划

1989年，采取了把研究计划进一步与本委员会的总计划进一步结合，因为各中心的所有活动中已采取按区域进行的形式。

任命了两名协调遗传多样性研究的人员，从而使研究计划得到加强。在1990年初将有第三名人员加入他们的行列，并任命一名驻在墨西哥的准研究人员。

第一批有四名科学家接受在访问学者计划下的赠款。这项计划使某些经选定的科学家能够访问研究机构，从而在本委员会主办的研究项目中进行合作研究。

种子保存的研究

国际植物遗传资源委员会主办的超干燥种子保存项目取得了喜人的结果。其它的项目研究了水分和温度对种子寿命的影响、难处理的种子的保存技术、在贮存和再生过程中的遗传稳定性和种子休眠的问题。

离体研究

1989年，国际植物遗传资源委员会继续发展离体采集和贮存技术，调查贮存的离体培养物的稳定性。国际植物遗传资源委员会与国际热带农业中心的离体活性基因库完成了对开展活动的模式标准的三年测试。两个中心将合作来扩大这项研究的影响。

1980年在诺丁汉大学开始执行的国际植物遗传资源委员会离体保存数据库项目，在1989年正式结束。在下半年进行了一项用户调查，以确定满足当前信息需要的最好方式。

植物病理学和检疫

由粮农组织和国际植物遗传资源委员会共同出版了关于芭蕉、可可、甘薯、大薯和食用天南星科植物的《种质安全交流技术规程》。召开了会议讨论制定关于豆科和柑桔类的技术规程。其它的项目包括：研制一种香蕉束顶病病毒的诊探器，病毒的快速编索引方法和无损害种子健康检测。

遗传多样性研究

1990年初，将对遗传多样性研究计划进行审查，以确定今后五年这项计划的方向。

关于遗传多样性某些方面的一些项目在1989年继续执行。新的活动包括对豇豆的遗传多样性开展一项调查，和对印度尼西亚的柑桔类和芒果的野生亲缘种进行一项生态地理调查。

遗传资源欧洲合作计划

技术磋商委员会在1989年召开的第四次会议上，建议遗传资源欧洲合作计划在1990－92年的第四期中，在作物网络系统的范围内加强其活动。已要求国际植物遗传资源委员会实施遗传资源欧洲合作计划第四期活动，该计划重新定名为作物遗传资源网络欧洲合作计划，以更准确地反映该计划的重点。

على المعايير النموذجية للعمل. وسيتعاون المركزان من أجل تحقيق أقصى استفادة ممكنة من نتائج هذه الدراسة.

وانتهى رسميا في عام ١٩٨٩ العمل في مشروع قاعدة بيانات الصيانة في المختبرات لدى المجلس الدولي والذي كان قد بدأ في جامعة نوتنجهام عام ١٩٨٠. وأجري في آخر العام استفتاء للمنتفعين بهذه القاعدة للتعرف على أفضل وسيلة لتلبية الاحتياجات من المعلومات الجارية.

أمراض النبات والحجر الزراعي

اشتركت منظمة الأغذية والزراعة والمجلس الدولي للموارد الوراثية النباتية في اصدار خطوط توجيهية بشأن انتقال المواد الوراثية بطريقة آمنة. وتناولت هذه الخطوط محاصيل الموز وجوز الهند والبطاطا والبام والقلقاسيات الصالحة للأكل. وتشمل المشروعات الأخرى ابتكار مجسات التشخيص لفيروس ثورد القمة في الموز، وطرق التصنيف السريع للفيروسات، وطرق اختبار صحة البذور دون الاضرار بها.

بحوث التنوع الوراثي

سيجري في أوائل عام ١٩٩٠ استعراض لبرنامج بحوث التنوع الوراثي من أجل تحديد اتجاه هذا البرنامج خلال السنوات الخمس القادمة.

وقد استمر العمل في عام ١٩٨٩ في عدد من المشروعات المتعلقة بالجوانب المختلفة للتنوع الوراثي. أما المبادرات الجديدة فتشمل دراسة عن التنوع الوراثي في الليبيا، ومسح ايكولوجي جغرافي للأقارب البرية للحمضيات والمانجو في اندونيسيا. وتناولت المشروعات الأخرى المعلومات الجارية عن نظم التربية، واستعرضت الأسس العملية لأعمال التجديد.

برنامج التعاون الأوروبي في مجال الموارد الوراثية

أوصت اللجنة الاستشارية الفنية، خلال اجتماعها الرابع عام ١٩٨٩، بتنفيذ مرحلة رابعة من برنامج التعاون الأوروبي في مجال الموارد الوراثية من أجل تعزيز نشاطات هذا البرنامج في اطار نظام شبكات المحاصيل. وطلب من المجلس الدولي تنفيذ هذه المرحلة الرابعة من برنامج التعاون الأوروبي على أن يعاد تسميته ليصبح برنامج التعاون الأوروبي من أجل شبكات الموارد الوراثية ليعكس على نحو دقيق بؤرة اهتمام هذا البرنامج.

اقتناء المواد الوراثية

أشرف المجلس الدولي للموارد الوراثية النباتية على بعثات لجمع المواد الوراثية في ٢٨ بلدا أو قدم الدعم لهذه البعثات التي نفذ الكثير منها في اطار البرامج القطرية.

التدريب

بدأ تنفيذ توصيات الاستعراض الذي أجراه المجلس الدولي في عام ١٩٨٨ لعمليات التدريب مع توجيه اهتمام خاص الى بنوك المورثات القطرية.

وقدم المجلس الدولي الدعم لتدريب ما يقرب من ١٠٠ عالم وفني في صورة منح للدراسات العليا وتنظيم الدورات الفنية المتخصصة القصيرة والبرامج الافرادية. وفي ديسمبر/كانون الأول، اشترك أحد عشر دارسا لدرجة الماجستير في دورة تجريبية في جامعة برمنجهام بالمملكة المتحدة ومقر المجلس الدولي في روما بمناسبة الاحتفال بالذكرى العشرين لبدء الدورة الدراسية للحصول على الماجستير في الموارد الوراثية النباتية من جامعة برمنجهام، والذكرى الخامسة عشرة لانشاء المجلس الدولي.

شبكات المحاصيل

جرى تكثيف العمل في المحاصيل المختلفة في اطار المشروع التجريبي (وهي الشعير والذرة والبطاطا والموز والبامية والعصة والبنجر). وقد اكتسب مفهوم هذه العملية ذاته قبولا عاما مما أدى الى بدء العمل في اقامة شبكات للعديد من المحاصيل الأخرى مثل الأرز والفرطم والسمسم وفول الصويا.

برنامج البحوث

شهد عام ١٩٨٩ عملية ادماج برنامج البحوث بدرجة أكبر في برنامج العمل الشامل للمجلس الدولي للموارد الوراثية النباتية بعد الأخذ بالمنهج الاقليمي في جميع أعمال المجلس. وجرى تعزيز البرنامج بعد تعيين موظفين اثنين لتنسيق بحوث التنوع الوراثي، سينضم اليهما موظف ثالث في أوائل عام ١٩٩٠، بالاضافة الى موظف بحوث مساعد سيكون مقره في المكسيك.

وقد حصل العلماء الأربعة الأوائل على منح بموجب خطة العلماء الزائرين التي تتيح اختيار بعض العلماء لزيارة مؤسسات البحوث من أجل الاشتراك في مشروعات البحوث التي يشرف عليها المجلس الدولي للموارد الوراثية النباتية.

بحوث صون البذور

حققت المشروعات التي يشرف عليها المجلس الدولي بشأن تخزين البذور بطريقة التجفيف الشديد نتائج مبشرة للغاية. وتناولت المشروعات الأخرى تأثيرات الرطوبة والحرارة على طول فترة بقاء البذور، وتقنيات صون البذور التي لا تحتاج الى معاملات خاصة، والاستقرار الوراثي خلال عملية التخزين والتجديد، ومشكلات "كمون" البذور.

البحوث المختبرية

واصل المجلس الدولي في عام ١٩٨٩ تطوير تقنيات الجمع والتخزين في المختبرات، ودراسة مدى استقرار البذور المخزنة في المستنبتات المختبرية. واستكمل المشروع التجريبي المشترك بين المجلس الدولي والمركز الدولي للزراعة الاستوائية عن بنوك المورثات العاملة في المختبرات التجارب التي استغرقت ثلاث سنوات

عين في شهر أكتوبر/تشرين الأول اخصائي مكتبات بغرض القيام والمكتبة بعملية تجميع كبيرة للدراسات المتعلقة بالموارد الوراثية النباتية لتلبية احتياجات الباحثين الخارجيين وموظفي المركز المهنيين.

وكان مجلس الأمناء قد وافق على استراتيجية مطبوعات المركز أثناء اجتماعه السادس عشر في فبراير/شباط. وتدعو الاستراتيجية، بجانب بعض الأمور الأخرى، الى زيادة عدد المطبوعات متعددة اللغات والبحث عن مشروعات مشتركة للنشر.

وفي عام ١٩٨٩، ركز مكتب الشؤون العامة على مجموعات المستهدفين القادرين أكثر من غيرهم على توفير الدعم لأعمال المجلس الدولي، أي على المجموعات التي تشكل السياسات العامة وتؤثر في الرأي العام. وصدر في يونيو/حزيران العدد الأول من مجلة Geneflow المعنية بالموارد الوراثية النباتية. وسوف تمول حكومة ايطاليا حملة لتعميق الوعي بهذا المجال في أمريكا اللاتينية في عام ١٩٩٠ يتولى تنفيذها المركز الدولي للبطاطس، والمركز الدولي للزراعة الاستوائية، والمركز الدولي لتحسين الذرة والقمح، والمركز الدولي للموارد الوراثية النباتية وخدمات الصحافة الدولية ومجلة "Diversity" تحت اشراف رابطة تعميق الوعي الجماهيري بالبحوث الزراعية الدولية.

استكملت في عام ١٩٨٩ شبكة المكاتب الاقليمية التابعة للمجلس الدولي بانشاء مكتب جنوب شرق آسيا في لوس بانوس بالفلبين. وقد أجريت في يونيو/حزيران عام ١٩٨٩ مراسم الافتتاح الرسمية لمكتبي المجلس في نيودلهي (لجنوب وجنوب شرق آسيا) وبكين (لشرق آسيا) على الرغم من أن هذين المكتبين يعملان بالفعل منذ عام ١٩٨٨.

البرنامج الميداني

وفي عام ١٩٨٩، شهد البرنامج الميداني المزيد من التعزيز بعد تعيين منسق مساعد لأمريكا الشمالية والوسطى والبحر الكاريبي، ومنسق لأمريكا الجنوبية، ومنسق مزامل لجنوب شرقي آسيا، ومنسق مساعد جديد لشرقي آسيا. وأصبح لدى المجلس الدولي الآن ثلاث وحدات لمناولة البذور، وثلاثة أخصائيين متفرغين لجمع النباتات. ففي عام ١٩٨٩ انشئت رسميا في الجامعة الوطنية في سنغافورة وحدة لمناولة البذور. واختتمت المفاوضات مع مركز التدريب والبحوث الزراعية الاستوائية في كوستاريكا بشأن انشاء الوحدة الثالثة. ومن المعروف أن الوحدة المقامة في "كيو" بالمملكة المتحدة تعمل منذ سنوات.

التوثيق والتوصيف

اجري في عام ١٩٨٩ استعراض لأعمال التوثيق والتوصيف في المجلس الدولي. وقد أبرز الاستعراض ما تمثله قواعد البيانات المحصولية المركزية من أهمية للجهود العالمية، وأوص بالتوسع في تطويرها في اطار البرامج التعاونية أو شبكات المحاصيل. وأصدر المجلس الدولي عددا من قوائم التوصيف في عام ١٩٨٩ وقدم الدعم لثمانية برامج قطرية لشراء معدات للحاسب الآلي. وبدأ العمل في تسعة مشروعات جديدة للتوصيف.

احتفل المجلس الدولي للموارد الوراثية النباتية بالذكرى الخامسة عشرة لانشائه في مبنى مقره الرئيسي الجديد بمدينة روما. أما الأحداث الهامة الأخرى التي شهدها عام ١٩٨٩ فهي القرار الذي اتخذه المجلس بأن يتحول الى مركز مستقل تماما من مراكز الجماعة الاستشارية للبحوث الزراعية الدولية فضلا عن الخطوات التي اتخذت لتحقيق هذا الوضع. فعلى سبيل المثال أرسى مشروع مذكرة التفاهم مع منظمة الأغذية والزراعة، الأساس لقيام علاقات علمية أمتن مع هذه المنظمة بعد الانفصال. وفي يونيو/حزيران ١٩٨٩، شكل رئيس الجماعة الاستشارية للبحوث الزراعية الدولية لجنة للمساعدة في اجراء المفاوضات بين هذا المركز (المجلس الدولي) ومنظمة الأغذية والزراعة بشأن خطط المركز لتحقيق الاستقلال الكامل ووضع الترتيبات الادارية الخاصة به في المستقبل.

وفي أكتوبر/تشرين الأول عام ١٩٨٩، أعلن البروفيسور J.T. Williams الرئيس التنفيذي للمجلس الدولي للموارد الوراثية النباتية، عن عزمه على الاستقالة كمدير لهذا المركز في ٢٨ فبراير/شباط ١٩٩٠ بعد أكثر من عشر سنوات في هذا المنصب. وسيتولى البروفيسور Williams منصبا جديدا هو مدير برنامج المحاصيل الشجرية الاستوائية المشترك بين الصندوق الدولي للبحوث الزراعية والمجلس الدولي للموارد الوراثية النباتية لمدة عامين تبدأ من ١٩٩٠/٣/١.

وحدد الاجتماع الثاني لجماعة العمل المشتركة بين مراكز الجماعة الاستشارية بشأن الموارد الوراثية النباتية عددا من مجالات التعاون فيما بين المراكز التابعة للجماعة الاستشارية للبحوث الزراعية الدولية.

وخلال عام ١٩٨٩، اتخذت الخطوات الأولى لاعداد الخطة الاستراتيجية طويلة الأجل الجديدة التي سيتبعها المركز. وقد أنشئت مجموعة صغيرة لوضع الاستراتيجية، ووضع جدول زمني لاعداد الخطة وافق عليه مجلس الأمناء. وسيجري في أوائل عام ١٩٩٠ استعراض داخلي لتهيئة الفرصة للتعرف على المدخلات التي سيقدمها موظفو المقر الرئيسي والموظفون الميدانيون.

الادارة

تولى الدكتور W.E. Tossell رئاسة مجلس الأمناء خلفا للدكتور W.J. Peacock، وانضم عضوان جديدان الى المجلس هما Ing R. Sevilla-Panizo (بيرو) والبروفيسور L.Monti (ايطاليا) خلفا للدكتور W.J. Peacock والدكتور A. Papasolomontos اللذين استقالا في فبراير/شباط. وانتخب المجلس البروفيسور V.L. Chopra نائبا للرئيس والبروفيسور D.R. Marshall رئيسا للجنة البرامج. وتشكلت لجنة للمقر يرأسها البروفيسور Marshall لدراسة المواقع التي سيقام فيها المقر الرئيسي للمجلس الدولي بعد استقلاله، وبدأت لجنة البحث برئاسة الدكتور C.F. Murphy في تحديد المرشحين المناسبين لمنصب المدير. وفي شهر يونيو/حزيران شغل منصب رئيس الادارة ورئيس المراقبين الماليين، وبذلك يكون قد استكمل تعيين رؤساء البرامج.

The European Cooperative Programme for the Conservation and Exchange of Crop Genetic Resources

Phase I of ECP/GR was initiated in 1981 by UNDP/FAO. Phase II (UNDP/IBPGR) followed in 1983 and focused on developing activities on *Allium*, *Avena*, barley, forage and legume grasses, *Prunus* and sunflower. Support for the project was provided on a cost-sharing basis by UNDP and the 26 participating governments. In 1985, the third meeting of the Technical Consultative Committee recommended continuation into Phase III, to be funded entirely by the countries themselves, as a means to strengthen the sustainability of the project activities. In addition, *ad hoc* collaboration on four additional groups of crops (*Beta*, *Brassica*, *Pisum* and *Vitis*) was started. Phase III became operational in June 1987 with the formal participation of 19 countries, increasing to 25 in early 1989.

Meetings

The main mechanism of the Programme is the crop Working Group meetings. These are attended by curators of the major collections and by breeders and crop specialists. Each Working Group reviews the collaborative programme, analyzing constraints and recommending further action. The meetings held in Phase III are listed in the Chronology.

European crop databases

Since the beginning of Phase II, ECP/GR's main concern has been with documentation activities, primarily the provision of information on other collections to increase accessibility. As collaborative activities developed, a good database system became a prerequisite for rationalizing individual collections. It was also essential for avoiding duplication of efforts on collections as well as for identifying gaps in the accessions. Hence, during Phase III, European crop databases have assumed an increasingly important role in coordinating the activities of the Working Groups. For example, the databases have been used to identify duplicates for further rationalization of collections (*Avena*, barley, sunflower), to establish a computerized bibliography of genetic resources (*Allium*, sunflower) and to search systematically for old certified cultivars not yet in collections (*Medicago*). In 1989, this trend to exploit databases to reach objectives defined by the Working Groups has accelerated and benefits should appear in Phase IV, e.g. the establishment of core collections (barley, forages), and mapping of collected accessions (*Allium*, forages). Table 6 lists operational European databases and relevant details. The

Table 6 **European databases operational in Phase III**

Crop/species	Institute
Allium	IHR, Wellesbourne, UK
Avena	FAL, FRG
Barley	ZIGuK, GDR
*Beta**	CGN, the Netherlands
Prunus	NGB, Sweden
Rye	PBAI, Poland
Cultivated *Brassica*	PBAI, Poland
Pisum	Wiatrowo Experimental Station, Poland
Sunflower Cultivated species Wild species	 CRI, Szeged, Hungary IFVC, Yugoslavia
Forages *Trisetum flavescens* and *Arrhenatherum elatius*	Research Station of Grasses, Roznov, Czechoslovakia
Poa spp	FAL, FRG
Lathyrus latifolius, *L. sylvestris*, *L. heterophyllus* and *L. tuberosus*	Institut de Biocenotique Experimentale des Agrosystèmes, Université de Pau et des Pays de l'Adour, France
Medicago perennial species	Groupe d'Etude et de Contrôle des Variétés et des Semences, INRA, La Minière, Guyancourt, France
Bromus spp	RCA, Hungary
Trifolium alexandrinum, *T. resupinatum* and wild related taxa	Field Crops Department, Faculty of Agriculture, Hebrew University of Jerusalem, Rehovot, Israel
Lolium annual species, *Phalaris* spp., *Vicia* spp. and *Hedysarum*	Istituto del Germoplasma, CNR, Bari, Italy
Dactylis spp. and *Festuca* spp.	PBAI, Poland
Trifolium subterraneum annual species	INIA, Spain
Phleum spp.	NGB, Sweden
Trifolium pratense	Federal Agricultural Research Station, Changins, Switzerland
Lolium multiflorum, *L. perenne* and *Trifolium repens*	WPBS, Aberystwyth, Wales

* This database, since the international *Beta* Genetic Resources Workshop, has had an international mandate

dates of the publication of the European catalogues are shown in the Chronology but this is only indicative, as the information is continually updated. The catalogues are published mainly to publicize the existence of the databases. Thanks to increasing computerization within institutes holding collections and, above all, the accumulation of expertise acquired through exchange between documentation officers of the various institutions, the dominant practice nowadays is to exchange data directly on floppy disks or magnetic tapes.

Collecting activities

Collecting priorities identified in Phase II were carried out successfully, with some exceptions, by National Programmes in Phase III. In a few cases, IBPGR has also been instrumental in supporting collecting activities, especially for wild species of *Avena*. Working Groups identifying endangered species and habitats have dramatically increased their collecting activities. For example, in the case of forages, collecting activities have risen from an estimate of 100 ecotypes of five species in 1985 (Forages Working Group Report, Second Meeting) to over 800 ecotypes of ten species in 1989 (Forages Working Group Report, Third Meeting).

Standard varieties

Sunflower, Forages and *Prunus* Working Groups have worked towards the adoption of common standard varieties, when allowed by ecoclimatic conditions, to help in the meaningful comparison of evaluation data.

Varieties of the list of Standard Forage Legumes in the Mediterranean Zone

Member countries (Phase III) of ECP/GR

1 Austria
2 Belgium
3 Bulgaria
4 Cyprus
5 Czechoslovakia
6 Denmark
7 Finland
8 France
9 FRG
10 GDR
11 Greece
12 Hungary
13 Ireland
14 Israel
15 Italy
16 Netherlands
17 Norway
18 Poland
19 Portugal
20 Spain
21 Sweden
22 Switzerland
23 Turkey
24 UK
25 Yugoslavia

ECP/GR Phase III chronology

Year/month	European catalogues	Meetings
1987		
July	*Bromus* (2nd edition) European Barley List *Trifolium alexandrinum* and *T. resupinatum* (first draft)	Phase III formally declared operational
August		Working session of the Sunflower Working Group, Szeged, Hungary
September	*Medicago* (annual species) *Medicago* (perennial species) (2nd edition)	Working session of the Forages Working Group, Lusignan, France
1988		
June	*Allium* (2nd edition)	
July	Cultivated sunflower (working document)	Sunflower Working Group third meeting, Novi Sad, Yugoslavia
September	*Medicago* (perennial species) (3rd edition)	*Allium* Working Group third meeting, Wellesbourne, UK
October	*Poa* (2nd edition)	
November	*Lolium perenne*, *L. multiflorum* and *Trifolium repens*	*Prunus* Working Group third meeting, Grünberg, FRG
December	*T. pratense* (2nd edition), *T. subterraneum* and annual *Medicago* (2nd edition)	
1989		
January		Forages Working Group third meeting, Montpellier, France
March		*Avena* Working Group third meeting, Radzikow, Poland
April		Barley Working Group third meeting, Gatersleben, GDR
May	*Perennial Lathyrus*	
September	Plum, peach, apricot, almond, cherry, wild *Hebanthus* spp.	
October		TCC fourth meeting, Szeged, Hungary

Contributing institutes and number of accessions registered in the European databases

Species	*Number of accessions*	*Contributing institutes*	*Maximum number of passport descriptors available*
Prunus	12 500	94	9
Barley	55 000	35	23
Brassica	4 700	4	43
Allium	3 900	23	19
Avena	17 000	21*	
Festuca	2 300	19	30
Lolium perenne and *L. multiflorum*	3 800	18	30
Dactylis	2 750	18	30
Trifolium pratense	1 700	17	30
Trifolium repens	600	17	30
Perennial *Medicago*	1 250	16	30
Pisum	22 000	14	9
Phleum	1 950	12	30
Cultivated sunflower	4 500	11*	21
Wild sunflower	1 500	11*	11
Annual *Medicago*	1 250	10	30
Trifolium subterraneum	2 450	9*	30
Poa	1 100	9	30
Bromus	400	9	30
Perennial *Lathyrus*	1 300	3	30

* Includes one or two institutes from USA

(29 varieties for 17 species) and of the list of Standard Varieties for Forage Genetic Resources in Northern and Middle Europe (36 varieties for 14 species, different ploidy levels or earliness being considered to depend on the species) are now widely used by European curators and breeders as international references. In the case of *Prunus*, 36 clones for 12 categories of crops were selected in 1988, mainly on the basis of their wide adaptability and plasticity. Nine curators from eight countries distribute virus-free clones of these reference varieties so that comparisons can be made using the same material throughout Europe.

Beta, Brassica, Pisum* and *Vitis

Insufficient funding to the Programme has prevented the convening of Working Groups for *Brassica*, *Pisum* and *Vitis*. Nevertheless, European databases for cultivated *Brassica* and *Pisum* have been established. The documentation work to date will allow the rapid development of collaborative activities when crop specialists/curators are able to meet together. The activities initiated within the framework of the ECP/GR for *Beta* were so successful that they led to the implementation of an international *Beta* network.

Future of the ECP/GR

18 countries were represented at the fourth meeting of the Technical Consultative Committee (Szeged, Hungary), which noted that the collaborative activities of Working Groups have gone beyond the necessary level of information exchange and collecting activities. Action has been initiated or is planned to improve genetic resources management, rationalize collections, implement core collections, enhance wild species, etc. In view of these new fields of activity and of the need to ensure regular meetings of the Working Groups, the Committee recommended to governments that a Phase IV (1990–1992) be implemented. To emphasize that Phase IV will focus its efforts on strengthening activities within the framework of the crop network system, the ECP/GR has been renamed the European Cooperative Programme on Crop Genetic Resources Networks. Taking into account IBPGR's previous coordinating services, much appreciated by all institutes and experts involved, IBPGR has been requested to execute Phase IV as one of its Special Projects.

GRIN	Genetic Resources Information Network, USDA
GTZ	Deutsche Gesellschaft fur Technische Zusammenarbeit, FRG
IARC	International Agricultural Research Centre
IAVH	Institut Agronomique et Veterinaire Hassan II, Morocco
IBTA	Instituto Boliviano de Tecnologea Agropecuaria, Bolivia
IBP	International Biological Programme
ICA	Instituto Colombiano Agropecuario, Colombia
ICAR	Indian Council for Agricultural Research
ICARDA	International Centre for Agricultural Research in the Dry Areas - CGIAR, Syria
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics - CGIAR, India
ICTA	Instituto de Ciencia y Tecnologea Agrecola, Guatemala
IDBB	International Data Base for Beta
IDR	Institut du Developpement Rural, Burkina Faso
IFPRI	International Food Policy Research Institute - CGIAR, USA
IFVC	Institute of Field and Vegetable Crops, Yugoslavia
IHR	Institute of Horticultural Research, Wellesbourne, UK
IIHR	Indian Institute of Horticultural Research, India
IITA	International Institute of Tropical Agriculture - CGIAR, Nigeria
ILCA	International Livestock Centre for Africa - CGIAR, Ethiopia
ILDIS	International Legume Database and Information Service, UK
ILRAD	International Laboratory for Research on Animal Diseases - CGIAR, Kenya
INIA	Instituto Nacional de Investigaciones Agrarias, Spain
INIAA	Instituto Nacional de Investigacion Agraria y Agroindustrial, Peru
INIAP	Instituto Nacional de Investigaciones Agropecuarias, Ecuador - also INIAP, Mexico
INIFAP	Instituto Nacional de Investigaciones Forestales y Agrecolas Pecuarias, Mexico
INRA	Institute National de la Recherche Agronomique, France, and Morocco
INTA	Instituto Nacional de Tecnologea Agropecuaria, Argentina
IPB	Institute of Plant Breeding, Philippines
IPO	Research Institute for Plant Protection, The Netherlands
IRCT	Institut de Recherches du Coton et des Textiles Exotiques, France
IRFA	Institut de Recherches sur les Fruits et Agrumes, France
IRHO	Institut de Recherches des Huiles et Oleagineux, France
IRRI	International Rice Research Institute - CGIAR, Philippines
ISNAR	International Service for National Agricultural Research - CGIAR, The Netherlands
IUCN	World Conservation Union, Switzerland
IVIA	Instituto Valenciano de Investigaciones Agrarias, Spain
JAAS	Jilin Academy of Agricultural Sciences, China
JBNB	Jardin Botanique Nationale de Belgique, Belgium
JICA	Japan International Cooperation Agency
KARI	Kenyan Agricultural Research Institute, Kenya
MAAR	Ministry of Agriculture and Agrarian Reform, Yemen PDR
NARS	National Agricultural Research System
NBPGR	National Bureau of Plant Genetic Resources, India
NACGRAB	National Centre for Genetic Resources and Biotechnology, Nigeria
NGB	Nordic Gene Bank, Alnarp, Sweden
NIAR	National Institute of Agricultural Research, Japan
NPGS	National Plant Germplasm System, USA
ORSTOM	Institut Français de Recherche Scientifique pour le Developpement en Cooperation, France
PARC	Pakistan Agricultural Research Council
PBAI	Plant Breeding and Acclimatization Institute, Poland
PBI	Plant Breeding Institute (Cambridge University), UK
PCARRD	Philippine Council for Agricultural and Resources Research and Development
PGRC	Plant Gene Resources Canada, Canada Agriculture
PGRC/E	Plant Genetic Resources Center, Ethiopia
QDPI	Queensland Department of Primary Industry, Australia
QTLS	Quantitative trait loci
RBG	Royal Botanic Gardens, UK
RCA	Research Centre for Agrobotany, Institute for Plant Production and Qualification, Hungary
RDA	Rural Development Administration, Republic of Korea
RFLP	Restriction fragment length polymorphism
SADCC	Southern African Development Coordination Conference
SEAP	Southeast Asia Programme - IBPGR
TISTR	Thailand Institute of Scientific and Technological Research
UNA	Universidad Nacional Agraria, Peru
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAC	Universidad de San Carlos, Guatemala
USAID	United States Agency for International Development, USA
USDA	United States Department of Agriculture
VIR	N.I. Vavilov Institute of Plant Industry, USSR
WARDA	West African Rice Development Association - CGIAR, Côte d'Ivoire
WPBS	Welsh Plant Breeding Station, UK
WWF	Worldwide Fund for Nature, Switzerland
ZIGuK	Zentralinstitut fur Genetik und Kulturpflanzenforschung, GDR

△ IBPGR HEADQUARTERS
c/o FAO of the United Nations
Via delle Sette Chiese 142, 00145, Rome, Italy
Tel: (39 6) 5744719
Telex: 4900005332 (IBR UI)
Email: 157:CGI101 or IBPGR
Fax: (39 6) 5750309

IBPGR REGIONAL OFFICES

1. North and Central America and the Caribbean
c/o CIMMYT
Apartado Postal 6-641, Mexico 06600 DF, MEXICO
Tel (52 905) 7613311 or (52 595) 42100 42011
Cable CENCIMMYT
Telex 1772023 CIMTEMI
Email 157 CGI201 or CIMMYT

2. South America
c/o CIAT
Apartado Aereo 6713, Cali, COLOMBIA
Tel (57 23) 675050
Cable CINATROP
Telex 05769 CIAT CO
Email 157 CGI301 or CIAT
Fax (57 23) 647243

3. North Africa, Southwest Asia and Europe
c/o IBPGR Headquarters
Via delle Sette Chiese 142, 00145, Rome, Italy
Tel (39 6) 5744719
Telex 4900005332 (IBR UI)
Email 157 CGI101
Fax (39 6) 5750309

4. West Africa
c/o ICRISAT Sahelian Center
BP 12404, Niamey, NIGER
Tel 722529
Telex ICRISAT 5436 NI
Email CGU004 or ICRISATSC
Fax 734329

5. East and Southern Africa
c/o ILRAD
PO Box 30709, Nairobi, KENYA
Tel (254 2) 592054/592151, residence 564051
Cable ILRAD
Telex 22040 ILRAD
Email 1074 CGU005 or ILRAD
Fax (254 2) 593499

6. South and Southeast Asia
c/o NBPGR
Pusa Campus, New Delhi 110012, INDIA
Tel (91 11) 5731845
Cable GERMPLASM PUSA COMPLEX IARI, CAMPUS ND 110012
Telex 3162216 FAO IN or 31 63390 NBPGR IN
Email 157 CGI114 or IBPGR DELHI

7. East Asia
c/o CAAS
30 Bai Shi Qiao Road, Beijing, CHINA
Tel (86 1) 8316594
Cable AGRIACA (CHINA)
Telex 222720 CASS CN
Email CGI153

8. Regional Committee for Southeast Asia
c/o Institute of Plant Breeding
University of the Philippines at Los Banos, College, Laguna 4031, PHILIPPINES
Tel (63 94) 2298/3304/2339
Telex 75254909 LBS PI
Email c/o IRRI 157 CGI401